Flow

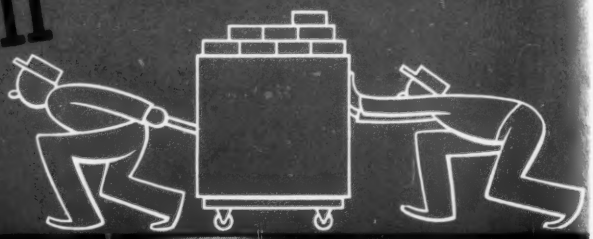
... THE MAGAZINE WHICH INTEGRATES MATERIAL HANDLING EQUIPMENT INTO THE FLOW OF PRODUCTION

AUGUST
1947

IN THIS ISSUE: Competition and a Better Way . . . Cost Comparison . . . Packaging Mechanics . . . When You Revamp Your Warehouse

Push and Pull

COST YOU PLENTY!



$775.00
F. O. B. Jackson

Get the Facts
Write for New
Model D Folder

The Trend is to

truck-man

FOR LOW-COST HAULING

YOU'RE THE MAN WE WANT TO SEE, if your plant *"can't afford"* motorized material handling. From small tool and die shops to sprawling factories, the trend is away from the snail's pace of the walking operator to the speed of gasoline power. Here are a few reasons owners are enthusiastic about Truck-Man:

- **It stands the gaff** 24 hours a day, with minimum down time. It's engineered for the job, built to highest standards...
- **Operator rides with the load,** reducing fatigue, trebling tonnage hauled. He's *proud* to operate a Truck-Man . . .
- **Handles 19 out of 20** skidded loads with ease. Lifts, starts and drops gently, protects floors and fragile material . . .
- **Amazingly easy to run** in high or low speed, turns in its own length. Ideal for narrow aisles, more productive floor space . . .
- **Simple, rugged construction** and VOLUME production mean first cost is low and replacements are all time-proven standard units . . .
- **Truck-Man means low investment,** low maintenance, low labor and fuel costs per ton of material moved . . .

Over 70 Truck-Man distributors in principal cities provide standard service.

1418 West Ganson, **truck-man** INC. Jackson, Mich.

Cut Costs of Loading and Unloading Trucks, Trailers and Cars with Automatic Electric Trucks!

• The system of loading and unloading materials from trucks, trailers and cars offers industry an amazing opportunity to cut handling costs as much as 50% or more and at the same time make labor happy with its new-found freedom from gruelling, manual handling.

Even though the ceiling height in many trucks or trailers is no more than 68 inches, there's an Automatic Electric Truck to tier palletized materials ceiling high and still take full advantage of "sky-high" stacking in your warehouse.

No matter what your product, there is an Automatic Electric Truck that will amaze you in its adaptability to automatically handle any type of material in any kind of lifting, moving or stacking operation in your plant.

An ATCO specialist will be glad to show you the possibilities of saving time, money and storage space with Automatic Electric Trucks. Mail coupon.

Be Sure to See ATCO'S New Film

"PAY LOADS... PAY OFF"

Automatic
ELECTRIC TRUCKS
Lighten LIFE'S LOADS

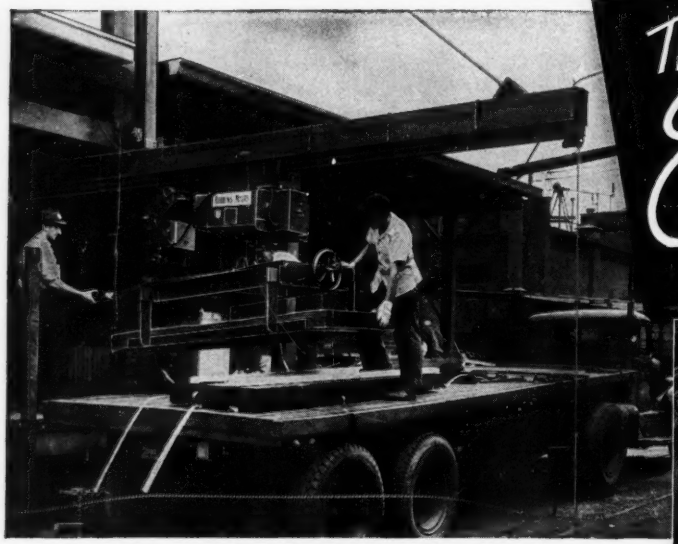
AUTOMATIC TRANSPORTATION COMPANY
DIV. OF THE YALE & TOWNE MFG. CO.
141 West 87th Street, Dept. M-7, Chicago 20, Ill.
( ) Send information on Automatic Electric Trucks.
( ) Have an ATCO Specialist make a free survey of my materials handling costs.
( ) Schedule me for an early showing of ATCO's new movie, "Pay Loads Pay Off."

Company Name.....
By.....*Position*.....
Address.....
City.....*Zone*.....*State*.....

MANUFACTURERS OF THE FAMOUS TRANSPORTERS, TRANSTACKERS AND SKYLIFT ELECTRIC TRUCKS

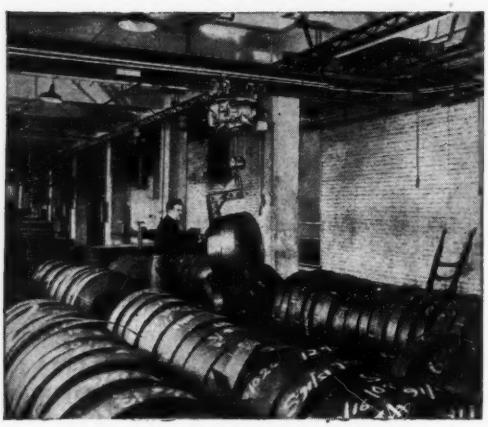
HANDLING STEEL

The Easy Way!

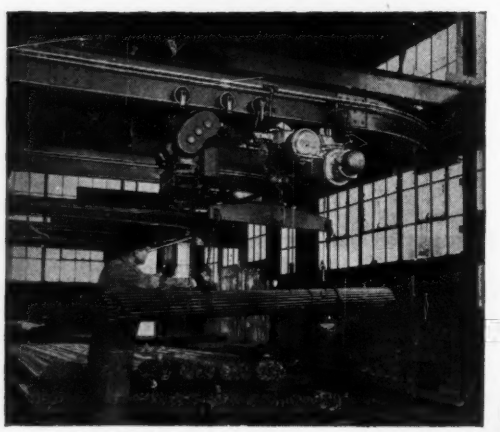


Power operated unit unloads steel by pushbutton control

Electric hoist with special hook, handles coils to process.



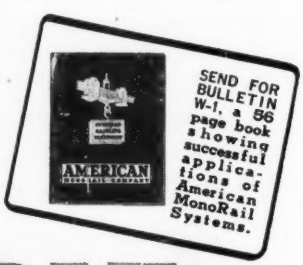
Power crane accurately spots 2-ton loads.



MonoTractor and 3-Ton hoist moves bar stock.

This tough job is made easy from start to finish —unloading stock from truck, to storage, to machines, to shipping—American MonoRail Systems, to fit any budget, afford faster handling, accurate spotting, reduced fatigue, added safety and greatly reduced damage.

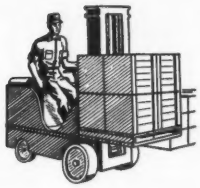
American MonoRail Equipment saves one company $20 on every truck unloaded; another saved $150 in the first four months. With thousands of installations to draw from, American MonoRail Engineers are well qualified to offer solutions involving overhead handling equipment. This service is offered without obligation.



THE AMERICAN MONORAIL COMPANY

13129 ATHENS AVENUE • CLEVELAND 7, OHIO

Mallory Chargers are available in six models for charging any electric industrial truck battery.



Assure Your Batteries Their Full Life . . . Use

MALLORY RECTOTRUCK (Trademark) Chargers

MALLORY Magnesium Copper Sulfide Rectifiers have conclusively demonstrated their superiority and dependability in low voltage, high current applications—especially where abnormal temperatures and abuse are encountered.

The Exide TVR Voltage Relay is the uncontested standard by which all others are compared. This relay insures positive and definite operation of the two-rate charge system at the proper battery voltage to provide *maximum* battery life.

This unbeatable combination assures you of long battery life, minimum servicing, truly automatic operation. Most important—your maintenance worries are over when you use Mallory Chargers.

Mallory Rectotruck Chargers are designed to charge both lead and Edison batteries to full capacity in minimum time.

Mallory Chargers are light and compact—easy to move when your working center changes—no need for special foundations or anchoring to the floor. They are free from vibration. You can always locate them where they will give the most service. Each will operate on either of two power line voltages. The extremely simple operation eliminates hydrometer readings and setting timer controls—merely connect the charger plug to battery receptacle. Upon completion of safe charge, both the power line and battery circuits are automatically opened.

Don't say truck battery chargers—say Mallory Rectotruck Chargers. Get model recommendations and catalog details from:

Automatic Transportation Co.
Baker Industrial Truck Div.
Barrett-Cravens Co.
Clark Tructractor Div.
Crescent Truck Co.
Elwell-Parker Electric Co.
Lewis-Shepard Products, Inc.
Lift Trucks, Inc.
The Moto Truc Co.
Wright-Hibbard Industrial Electric Truck Co., Inc.
The Yale & Towne Mfg. Co.
Philadelphia Division

Rectifier Charger Pioneers Since 1927

The Only Chargers with the Unbeatable Combination of

P.R. MALLORY & CO. Inc.
MALLORY
Magnesium Copper Sulfide Rectifier

Most rugged, dependable rectifier for low-voltage, high-current applications.

Unaffected by high temperature operation under adverse atmospheric conditions.

Phenomenal ability to withstand abuse and accidental short circuits. Self healing.

Stable, consistent charging without adjustment over long life.

Minimum maintenance—no brushes, bulbs, sparking contacts.

and

Exide
TVR Voltage Relay
(*Reg. U. S. Pat. Off.*)

Precision temperature-compensated voltage relay.

Exclusive, patented inverse temperature compensating feature.

Operates during the rapid rise in the charging voltage characteristic of a lead battery.

Reduces high initial charging rate to low safe finishing rate.

Starts synchronous timer which controls length of time at finishing rate.

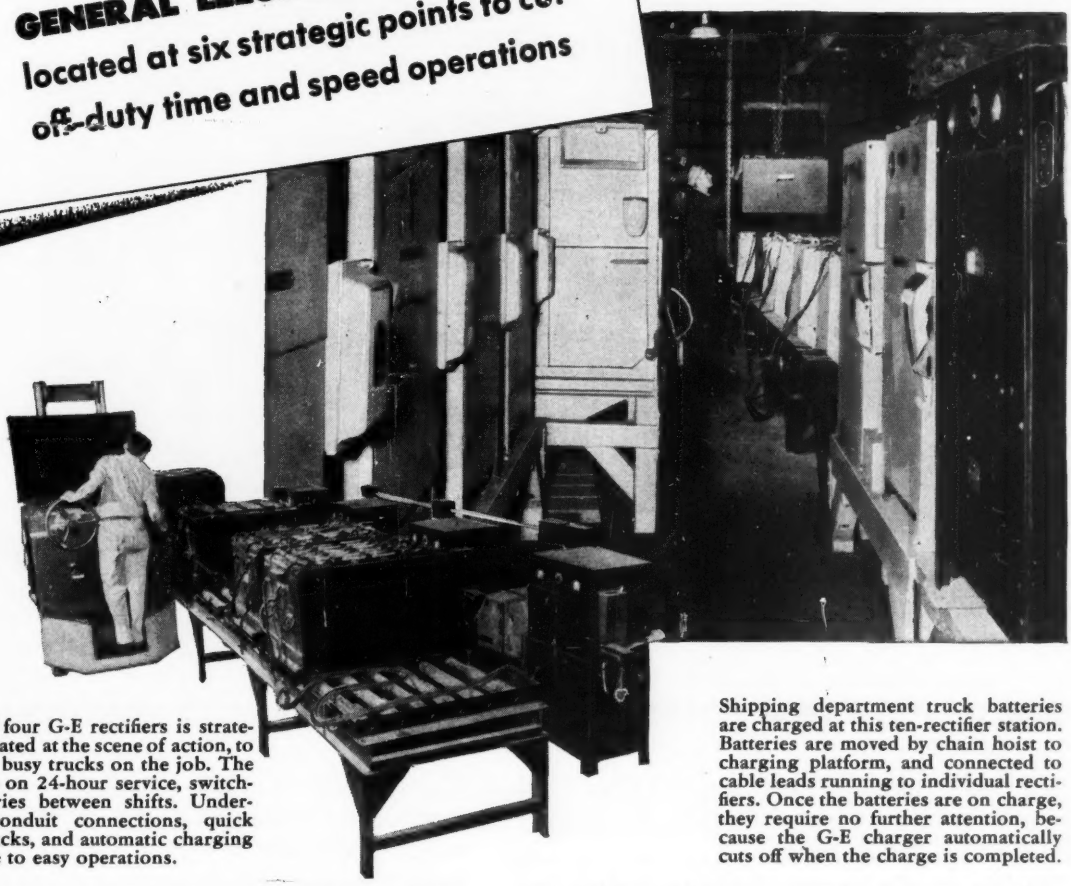
Approved by leading lead battery manufacturers.

P.R. MALLORY & CO Inc
MALLORY RECTIFIERS
MAGNESIUM COPPER SULFIDE RECTIFIERS — RECTOPLATORS*— RECTOTRUCK CHARGERS — AVIATION RECTOSTARTERS*— RECTOPOWER* SUPPLIES — AUTOMATIC BATTERY CHARGERS
*Reg. U. S. Pat. Off.

P. R. MALLORY & CO., Inc., INDIANAPOLIS 6, INDIANA

Huge Industrial Plant Keeps Big Truck Fleet At Top Efficiency

GENERAL ELECTRIC RECTIFIERS
located at six strategic points to cut off-duty time and speed operations



A bank of four G-E rectifiers is strategically located at the scene of action, to keep four busy trucks on the job. The trucks are on 24-hour service, switching batteries between shifts. Underground conduit connections, quick roll-out racks, and automatic charging contribute to easy operations.

Shipping department truck batteries are charged at this ten-rectifier station. Batteries are moved by chain hoist to charging platform, and connected to cable leads running to individual rectifiers. Once the batteries are on charge, they require no further attention, because the G-E charger automatically cuts off when the charge is completed.

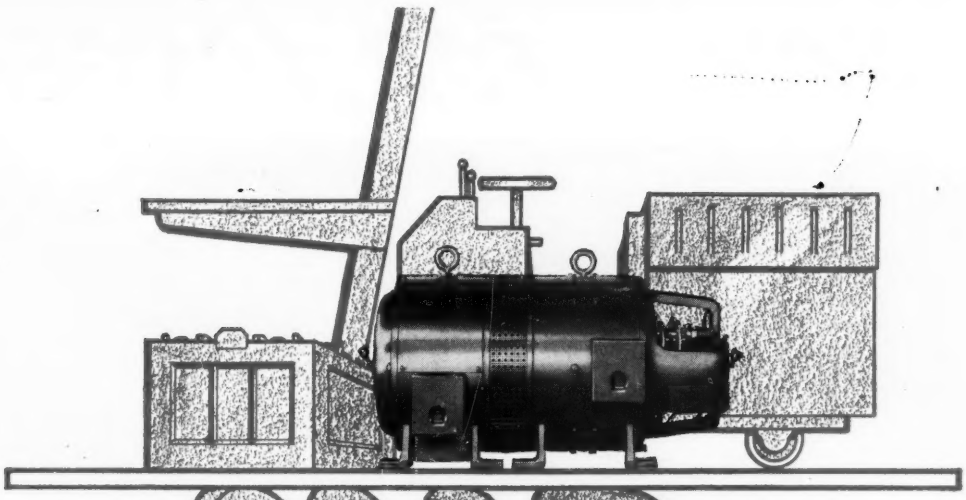
Helping to solve a difficult materials handling problem at Bakelite Corporation's Bound Brook, N. J., plant, twenty-two General Electric copper-oxide rectifiers are used to meet the requirements of widely separated truck operations. Charger stations are located in various manufacturing, storage, and shipping areas, in order to be readily available for between-shift charging. They are also used for giving truck batteries a quick boost if it is needed during work periods.

These efficient General Electric chargers service a number of different types of trucks which have 12-, 15-, or 18-cell batteries. Some are in constant use, others are on a standby basis.

But all have had a consistently fine record of low maintenance and economical operation. Many have had no repairs of any kind for two years, and there has not been one major failure in the five years in which this type of equipment has been in use at Bakelite.

Performance like this is typical of General Electric charger installations throughout industry. If you would like to know how this equipment can make your materials handling problems easier, too, we'll be glad to send you a copy of our book *Aids To Economical Faster Materials Handling*. Just write to *Section A83-836, Appliance and Merchandise Department, General Electric Company, Bridgeport 2, Connecticut.*

GENERAL ELECTRIC



THEY GO TOGETHER FOR

Proved Performance

BATTERY-POWERED industrial trucks have established a record of outstanding performance in every industry. BUT inadequate or unsuitable charging facilities will inevitably *shorten* battery life, increase maintenance costs and make impossible the maximum usage of the trucks.

In 1910, The Electric Products Company introduced the first AUTOMATIC Battery Charger. Since then, paralleling the growth of materials handling equipment, the development of E.P. Chargers has progressed until, today, they most efficiently and advantageously combine:

- **Completely Automatic Operation** . . . eliminates the need for specially trained personnel in continuous attendance at Charging Stations.
- **Modified Constant-Voltage Method of Charging** . . . assures that batteries are properly charged. Generator voltage remains constant within extremely close limits at all loads and temperatures.
- **A design built specifically for the individual application.** While the parts that go into the assembly of an E.P. Charger are standardized and every one proved by years of field service, every E.P. Charger is designed, built, adjusted and tested to match the needs of the specific batteries it is to service.

The Battery Charger is not just another piece of equipment required for the Materials Handling System. It's the "core" of the whole operation. It controls the operating continuity of a dollar investment many times greater than itself. Modern plant production . . . and profits . . . depend upon the constant availability of battery-powered trucks. But if the Battery Charger is not capable of doing its job at all times . . . with only minimum maintenance . . . costly production delays will unavoidably occur. Consider too that the life of a properly designed Battery Charger will be many times that of the batteries it serves.

ASK FOR BULLETINS 203, 205 and 206

EP -X-28

THE ELECTRIC PRODUCTS COMPANY

1730 CLARKSTONE ROAD CLEVELAND 12, OHIO

SAFER SLING LIFE

THE ROEBLING

WALLES SPLICE

NO SERVINGS—NO PROTRUDING WIRE ENDS

HERE'S ROEBLING'S latest aid to safe sling practice—the Walles Splice—to give your slings greater safety and handling convenience, better appearance, lasting stability. Neatly tapered, precisely made, this new splice saves load-handling time because it pulls easily, quickly through restricted openings. It needs no servings . . . all wire ends are securely buried in the center of the splice.

What's more, with no wire ends protruding, injuries to your workmen's hands due to this cause are eliminated. And sling life is lengthened, especially when the splices in your slings are used so that they scrub around or under a load. For you don't have the loosened or dislodged servings that sometimes cause slings to be prematurely discarded.

The Roebling Walles Splice is made with or without thimbles . . . with some types of fittings attached . . . with standard loop or one made to *your* specifications . . . in all wire rope sling sizes up to and including 1" diameter. Send coupon for full information today.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities

THESE FREE AIDS TELL YOU HOW TO CHOOSE AND USE THE RIGHT SLING

The new Roebling Sling Data Book offers you complete data on 3 principal wire rope sling types, classes of loads, proper design for required safety factor, tips for getting more service from your slings, details on sling sizes and fittings, and other information needed for correct sling selection and use.

With the handy Roebling Sling Calculator you can quickly, surely determine the safe working load for your slings on every class of lift. Printed on the rugged surface of this easy-to-use slide rule are simple yet complete instructions . . . plus tables and diagrams that simplify figuring the correct answers to your hoisting problems.

Manufacturers of Wire Rope and Strand Fittings • Slings • Aerial Wire Rope Systems • Aircord, Aircord Terminals and Air Controls • Ski Lifts • Electrical Wire and Cable • Suspension Bridges and Cables Hard, Annealed or Tempered High and Low Carbon Fine and Specialty Wire, Flat Wire, Cold Rolled Strip and Cold Rolled Spring Steel • Screen, Hardware and Industrial Wire Cloth • Lawn Mowers

JOHN A. ROEBLING'S SONS COMPANY
DEPT. 311 TRENTON 2, NEW JERSEY

Gentlemen: Please send me without obligation:

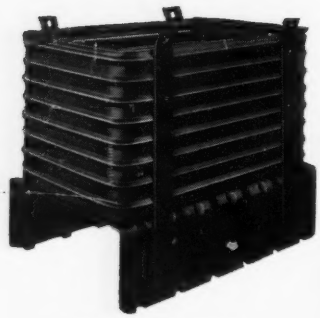
☐ ROEBLING SLING DATA BOOK ☐ ROEBLING SLING CALCULATOR ☐ ROEBLING WALLES SPLICE BOOKLET

*Name*_____

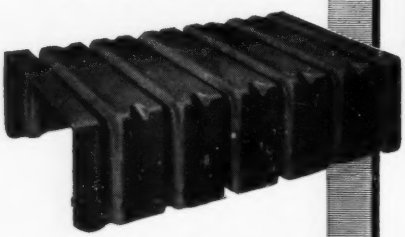
*Address*_____

*Title*_____

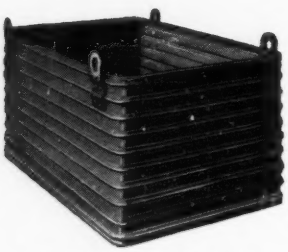
*Company*_____



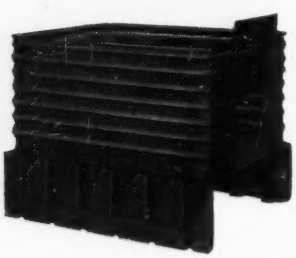
Type PB-120L Truscon Box and Platform with full length lifting lugs.



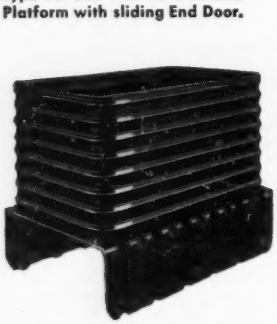
Type P-1. Truscon One Piece Steel Skid Platform.



Type B-80C Truscon Box Equipped for Crane Handling.



Type PB-650 Truscon Box and Platform with sliding End Door.



Type PB-120 Truscon Steel Box and Platform.

IF YOU'VE GOT A

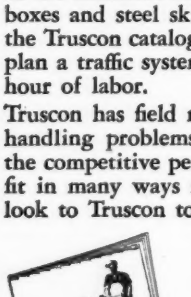
MATERIALS-HANDLING PROBLEM...

there's a Truscon Answer for it!

● The jumbled, helter-skelter handling and storage of materials, parts and finished products has no place in today's efficiency plan for profits.

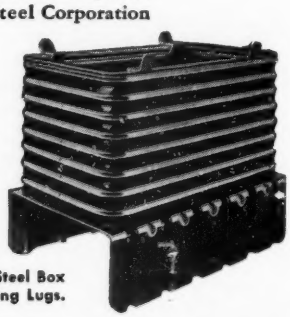
The slow piece-by-piece handling and moving of materials in any step of your manufacturing process, from raw materials to finished product, is costly throughout the day. Because of long experience in the materials handling field, Truscon has a wide range of steel boxes and steel skids that will exactly fit your needs. Write for the Truscon catalog of materials handling equipment, to help you plan a traffic system that will encourage greater output per man hour of labor.

Truscon has field men who have helped solve many materials handling problems, and can be of helpful assistance to you. In the competitive period of industry that lies ahead, you will benefit in many ways from Truscon Steel Boxes and Steel Skids—look to Truscon to help you now.

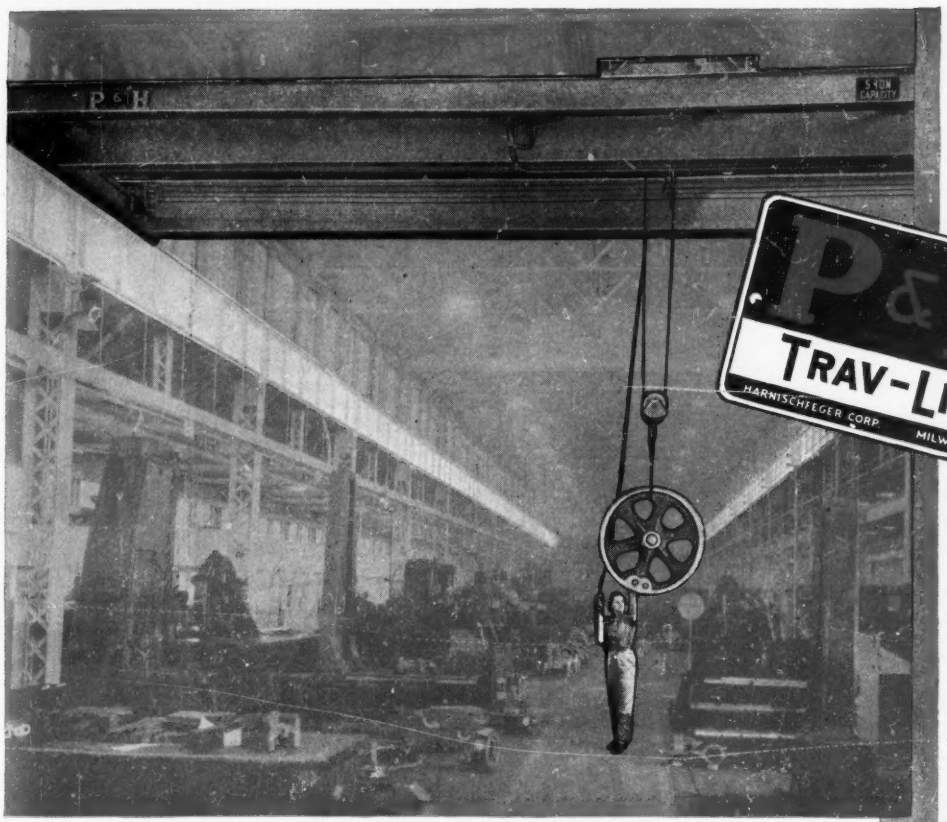


TRUSCON
STEEL COMPANY
Pressed Steel Division
6202 TRUSCON AVENUE • CLEVELAND 4, OHIO
Subsidiary of Republic Steel Corporation

Truscon Double Face Steel Pallet.



Type PB-120T. Truscon Steel Box and Platform with Tiering Lugs.



TAKE THE "MUSCLE" OUT OF MOVING

with "THRU-THE-AIR" handling!

It doesn't pay to "sweat" loads here and there—not when push buttons do it for less!

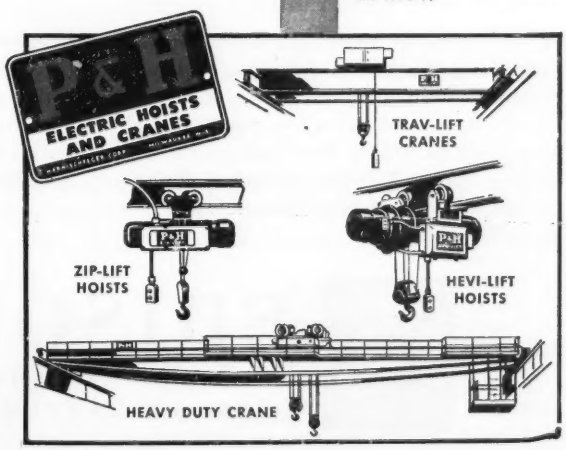
"Thru-the-air" handling, as typified by P&H Trav-Lift Cranes, saves time and money on every move. Without effort, without delay, it moves any kind of load from any point to any other within the area served. And every action of the load—lifting, moving, lowering—is accurately controlled by the operator's thumb!

Where handling needs are varied, and service intermittent, there is no surer way to cut costs than with P&H Trav-Lift Cranes. Available with floor or cage control, capacities up to 15 tons. See bulletin at right.

See how others are profiting with P&H Trav-Lifts. Forty pages of application pictures and complete specifications — in your free copy of Bulletin H13-1.

The *Extras* Are STANDARD EQUIPMENT, Added Values on P&H Trav-Lift Cranes

- Shaved gears for lifetime service . . . all bearings grease-sealed.
- Thermal overload protection against motor burn-outs . . . twin brakes for extra safety.
- Motors specifically designed and built by P&H for crane service . . . hoisting, trolley, bridging.
- Effortless push-button control . . . available for all motions and with variable speed feature.
- Transformer provides 110 volts at push-button.
- P&H's true motor ratings assure against failure at full capacity loads and speeds.

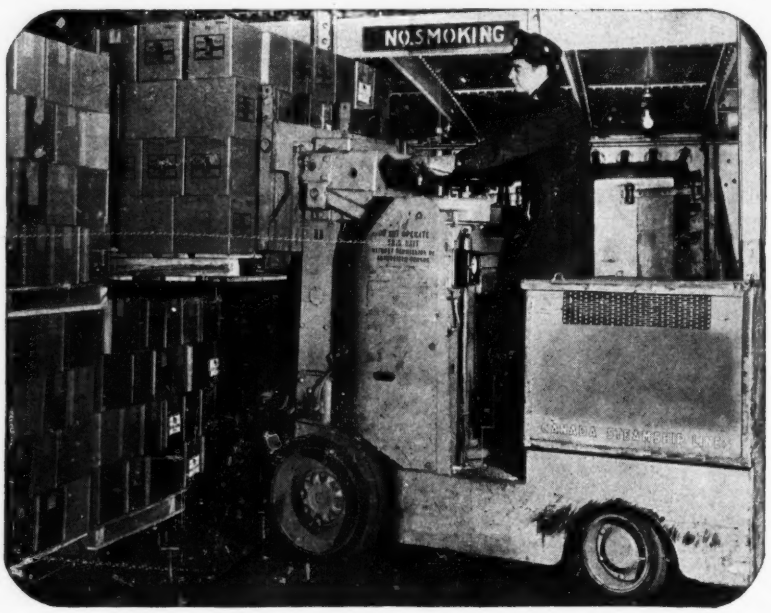


P&H

ELECTRIC HOISTS
4643 West National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION
ELECTRIC CRANES · EXCAVATORS · ARC WELDERS · P&H · HOISTS · WELDING ELECTRODES · MOTORS

Use Battery Trucks for SAFE *handling*



. . . and Low-Cost Power

One of the outstanding advantages of battery industrial trucks for material handling is their inherent safety. Because they give off no fumes and are practically free from fire hazards, they can be used without restriction in almost any kind of plant. They can even be provided with spark-enclosed construction for safe operation in hazardous locations.

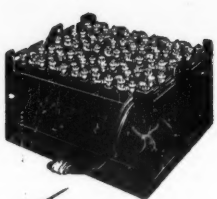
With batteries exchanged two or three times per 24-hour day, the truck is kept continuously supplied with power. While one battery operates the truck, another is being charged. Except for the few minutes needed to change batteries, the truck need not stop for servicing its power unit. Its electric motor drives have a minimum of wearing parts; are inherently simple and trouble-free. The truck starts instantly; accelerates smoothly; operates quietly; consumes no power during stops. Not only does it make efficient use of power but the current used for battery charging is the lowest-cost power available.

Thus the battery truck is an inherently dependable, safe and economical handling unit, especially when powered by EDISON Nickel-Iron-Alkaline Batteries. With steel cell construction, a solution that is a natural preservative of steel and a fool-proof principle of operation, they are the most durable, longest-lived and most trouble-free of all batteries. *Edison Storage Battery Division of Thomas A. Edison, Inc., West Orange, New Jersey. In Canada: International Equipment Company Limited, Montreal and Toronto.*

EDISON

Nickel • Iron • Alkaline

STORAGE BATTERIES



In Industrial Trucks,* EDISON *Nickel-Iron-Alkaline Batteries Give You These Important Advantages

They are **durable mechanically;** grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.

They can be **charged rapidly;** gassing cannot dislodge the active materials.

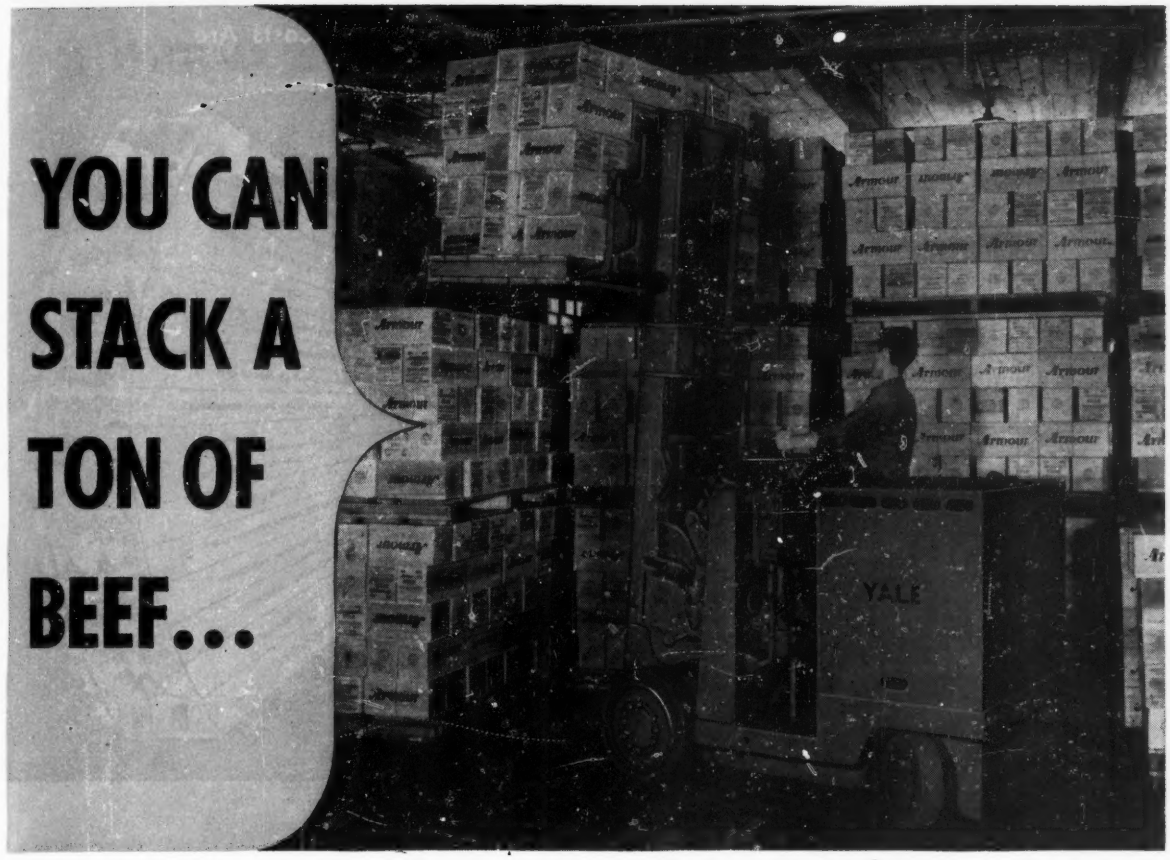
They **withstand temperature extremes;** are free from freezing hazard; are easily ventilated for rapid cooling.

They are **foolproof electrically;** are not injured by short circuiting, reverse charging or similar accidents.

They can **stand idle indefinitely** without injury. Merely discharge, shortcircuit, and store in a clean, dry place.

They are **simple and easy to maintain.**

YOU CAN STACK A TON OF BEEF...



... for less than the Price of a "Frank"

There's real economy in moving and high-stacking material with Yale-power instead of man-power. Whether it be beef, steel, flour, cement or castings, the results are the same: more output per manhour, increased production, lower unit cost . . . faster, safer, more efficient handling. Piece-by-piece re-handling is eliminated, time and effort saved, ceiling-high stacking saves storage space.

Find out today how Yale Trucks can help you save money on your material handling operation by cutting your handling costs. Telephone our nearest representative, or write direct to: The Yale & Towne Manufacturing Co., 4530 Tacony St., Philadelphia 24, Pennsylvania.

YALE

MATERIAL HANDLING MACHINERY

CUTS PRODUCTION COSTS... SAVES TIME... SAVES EFFORT... PROMOTES SAFETY

KRON INDUSTRIAL SCALES • HOISTS—HAND AND ELECTRIC • TRUCKS—HAND LIFT AND ELECTRIC

Generalift PALLETS

● One of the most "alive" subjects in the field of materials handling is the use of pallets. Palletized handling cuts costs. Palletized handling speeds production.

Generalift pallets and skids are tough and long lasting—made from sturdy hardwood—assembled with drive screw or ring shank nails. Stringers are flush or set in and special chamfering is available if needed.

Generalifts are manufactured in your sizes—prompt shipments. Call or write our nearest office for prices.

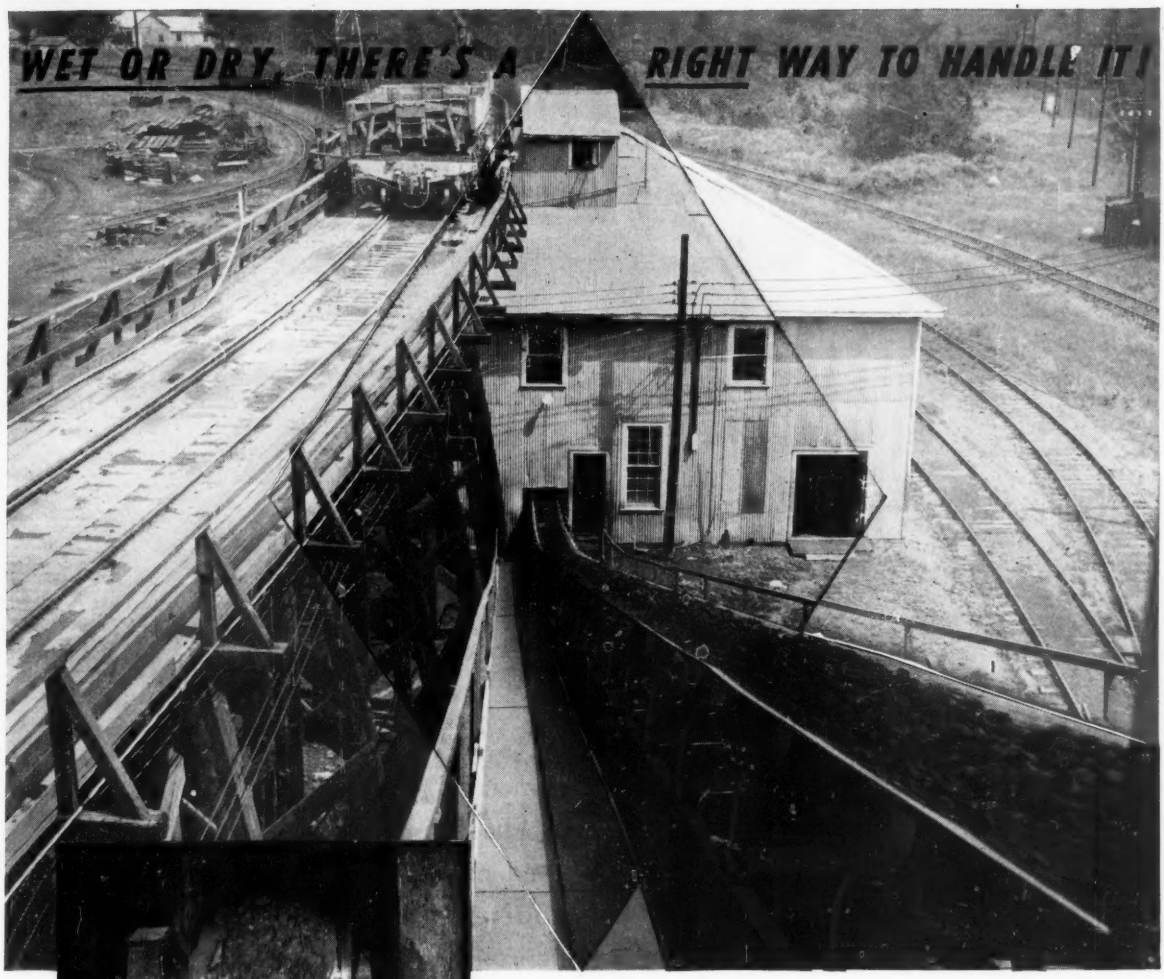
25 YEARS YOUNG
1922·1947

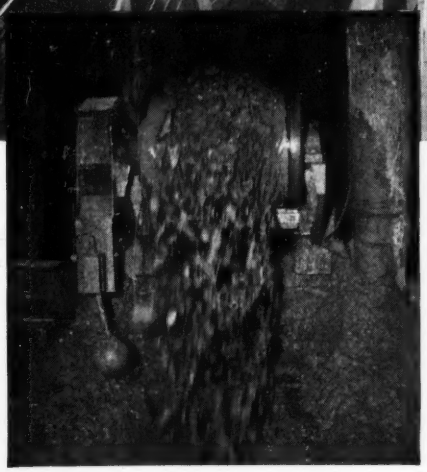
ENGINEERED SHIPPING CONTAINERS

GENERAL BOX COMPANY

GENERAL OFFICES: **60 W. Illinois St., Chicago 10, Illinois**
DISTRICT OFFICES AND PLANTS: **Brooklyn, Cincinnati, Detroit, East St. Louis, Kansas City, Louisville, Milwaukee, New Orleans, Sheboygan, Winchendon, Natchez. Continental Box Company, Inc.: Houston, Dallas.**

Barber-Greene





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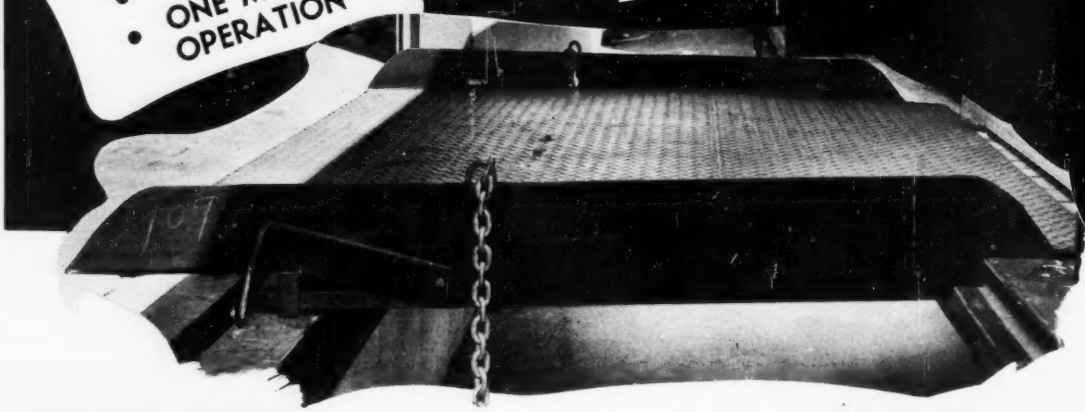

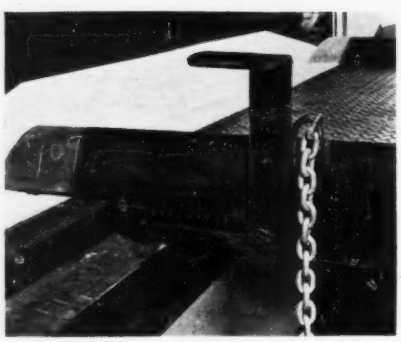

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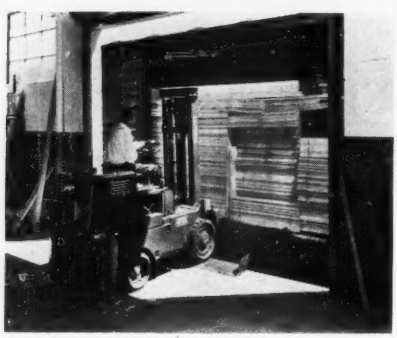
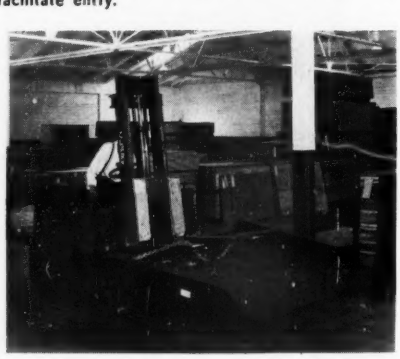


Diamond safety plate is non-skid. Crowned for different car or lock levels. Side guards prevent personnel and equipment accidents. Beveled edges facilitate entry.

One-man operation. Operator places lifting chains in locking slots.



Lifting chains placed and ramps lifted easily by one man.

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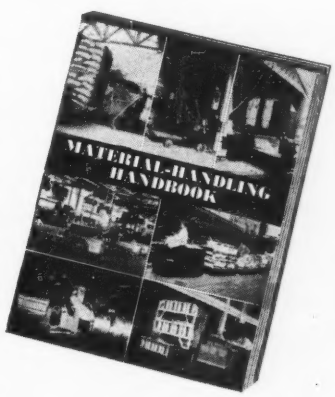

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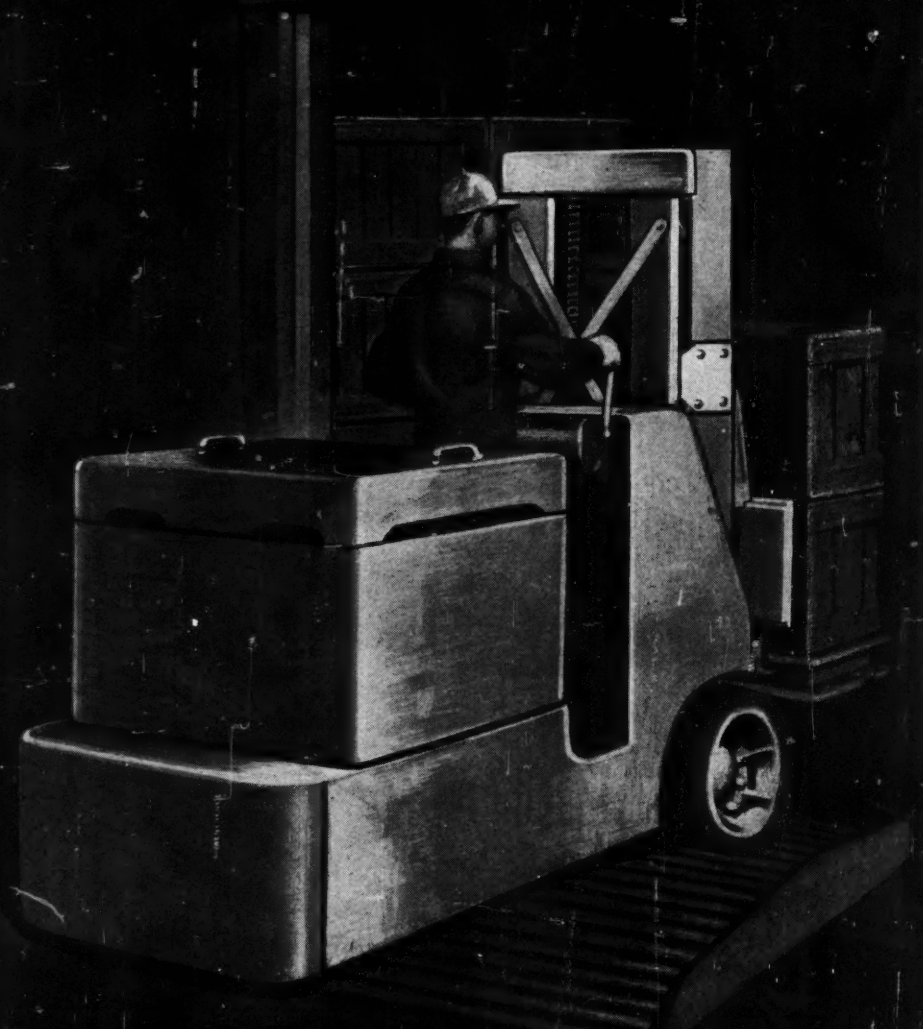

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VOLUME 2, No. 11

Flow

AUGUST, 1947

COVER PHOTO—Mr. Maxey Jarman, General Shoe Corp., the author of this month's guest editorial, page 21, "Competition . . . And a Better Way." A timely message by a business leader on two potent forces that affect all industry.

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Competition . . . And a Better Way

By MAXEY JARMAN

Chairman of the Corporation
General Shoe Corporation, Nashville, Tenn.

AS WE GET farther away from wartime industry operation and the adjustment that followed during the postwar period, we again come into the era of real competition. Competition is the potent force that affects every business. When, for example, someone else moves ahead of us, competitive rivalry immediately stimulates our thinking. We are spurred on to find a better way of operating our business, to develop more economical methods of handling our problems—and materials. We not only want to meet competition, but get out in front.

Competition has far-reaching effects. It means a better standard of living for America. Wasteful ways of doing things are constantly being eliminated. Merit is recognized and given its proper reward. In other words, a guiding principle in all our thinking is that there is always a better way of doing the job.

In the opening paragraph I mentioned more economical methods of handling materials. Modern material handling procedures, engineered to specific layout and product needs, still represent a major area in industry where greater operating improvements and operating economies can be achieved. The "better way," engineered with efficient material handling methods, has given many a business a new lease on life, new competitive strength. It has meant better production through elimination of wasteful methods and spoilage, with resultant lower unit cost of the finished product.

Here at General Shoe we have completely changed our material handling procedures, and are planning still further improvements as time goes on. Our plants are scattered through several states. We have a few central warehouses which serve these various plants. A fleet of highway trucks carries material to the factories and returns the finished products to the shipping warehouses.

For speedier and more economical operation, we have found it desirable to centralize control of the highway truck fleet and to schedule all truck routes to dovetail with manufacturing requirements. New over-the-road equipment has been put into service as fast as it became available. New docks and receiving facilities have been installed in every plant in order to provide for quick handling of incoming and outgoing loads.

Within the warehouses and the manufacturing facilities themselves, motorized equipment has been applied extensively, and conveyor equipment has been installed wherever it could do the job economically. Still further work is being done in this direction. It must be done if we are to meet the competitive problems that we are up against every day. We must give prompt service and economical service.

The potent force of competition makes it mandatory upon industry to study every phase of its material handling problems. This is the way to save waste of time and waste of effort, and the way to better working conditions and better customer relations.

This is the lesson we have learned from our past and continuing efforts.

When you Plan a Pallet Handling Program . . .

A COST COMPARISON

Here is a cost comparison method that is used to determine, beforehand, to what extent pallet handling will be profitable. This simple-to-use form can save you guesswork and dollars.

WHEN you plan to change your product from one type or model to another, you may at the same time consider the adoption of a pallet handling program.

Will it pay? This becomes the all-important question that must be answered. The answer will determine whether or not you make the move, or it will tell you to what extent the new program will be a saving over the old method.

You can determine the savings beforehand, making it unnecessary for you to grope through a period of guesswork. The procedure is a relatively simple one and requires some research and investigation. This preliminary investigation of the actual methods and handling equipment more than furnishes data for the cost comparison to be made. It will dredge up much essential information about the physical handling program itself, preparing the way for the actual operation by avoiding trial-and-error methods. (See specific points on this subject in the concluding part of this article.)

Things to Consider

The cost comparison is of course made between the present and the proposed methods. Following are some general observations before we consider the details of the procedure. To be of value, the comparison must be made of each individual piece to be handled. If there is any "lumping together", some cost items are bound to remain hidden. This would only tend to distort the true picture.

The comparative chart reproduced on these pages shows a simple form that is effectively used for the purpose. This firm, incidentally, does not authorize any innovations in handling procedures until all the required before-and-after figures show conclusively that a saving will be realized. This particular fabricating plant was required to produce large quantities of parts in order to take advantage of economical manufacturing cycles. The components were stored in an outlying warehouse and from here shipped to an assembly plant (all located in the same city). All figures given in the form are based on a 60-day production cycle.

NOTE: This discussion covers cost comparisons between present and proposed (pallet) handling only, and assumes the presence of pallet handling equipment in other

PALLETIZATION ANALY

(all figures based on 60 day p

TYPE AND NUMBER OF PALLETS REQUIRED								WEIGHTS HANDL		ONTAIN IBUTA (One Ea
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
PART NAME	PART NO.	PROD. PER DAY	PIECES PER PALLET	DOUBLE FACED 40x48	SEPARATOR TYPE 40x48	BOX TYPE 40x48	RACK TYPE 40x48	No. of Lbs. Per Pallet	YEARL TOTAL IN TON	PRESENT Based on trips per container)
Item A	6400	200	24		500			2610	654	$ 0
Item B	3333	401	585			41		2760	57	94

Can Determine the Savings Beforehand

departments of the plant. Hence the *extension* of load unit handling to a new product is the sole interest of this presentation. The requirements of a complete costing system, and the application of such controls, are presented in detail in FLOW for April, page 18.

Components of this general type had been handled by various methods and with a variety of load carriers, but now a pallet handling program was contemplated. The management wanted proof that the investment required in pallets would be offset by the savings realized. All the comparisons were made on the basis of palletization vs. the usual shipping and storage practices used up to that time—boxing, crating, and loose bulk shipments. The items involved here were finished castings and forgings which ranged in weight from one half pound to 600 pounds each. Specific methods and containers used up to that time depended entirely on the physical characteristics of these parts.

The form includes all pertinent data regarding each piece part, such as the name, number, model, daily production, amount of pieces per pallet, and the total weight of the pallet load. From these data, the actual cost figures are developed. These cover the number of pallets required for a year's production, the total amount of pounds to be handled, and the cost of the pallets required as compared with the cost of the containers used previously.

Certain rates for handling materials are available, or can be readily ascertained, for shipments that are loose, boxed, crated or palletized. The best criterion is on the basis of weight, and frequently it is found that various rates per 100 pounds of material handled must be determined, depending on the weight, density and size of the products. In other words, bulk items (casting and forgings) would generally fall into one rate structure; bulk sheet metal parts into another; boxed material into a third, and large crated shipments into still another classification.

Generally speaking, the most economical handling rate for these products was obtained with palletization; second were bulk shipments of castings and forgings; third, bulk shipments of sheet metal parts; fourth, crated shipments of forgings, casting or sheet metal parts. The most expensive method was found to be the manual handling of individual boxes.

It was previously mentioned that all three plants—fabricating, storage, assembly—were located in the same city. Hence freight charges for the return of empties were not involved here. The pallets were transported by the company's own highway trucks.

Making the Comparison

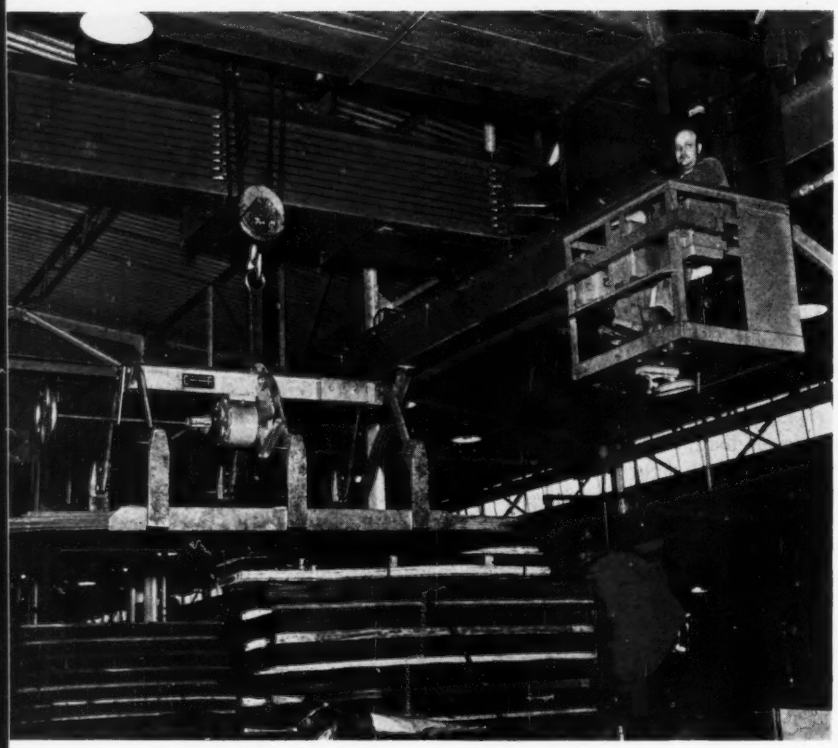
Let us now scrutinize the columns of the cost comparison chart. The form is reproduced substantially as used, with only minor modifications made for present purposes. The first line (Item A) illustrates an operation that was a bulk handling job, and consequently it required no containers. Line two (Item B) compares individual box handling vs. palletized shipments. Items A and B could of course be any products you fabricate and ship, whether made of wood, plastics, paper products, metal or a

(Continued on page 55)

NALYSIS DATA

ay production cycle)

ONTAINER COST ATTRIBUTABLE PER TRIP (One Each 60 Days)		SHIPPING DEPT. LABOR COST		WAREHOUSING DEPT. LABOR COST		RECEIVING DEPT. LABOR COST		TOTAL MATERIAL AND LABOR COST		SAVINGS PER ITEM (Per 60-Day Period)
(11)		(12)		(13)		(14)		(15)		(16)
PRESENT (Based on 3 trips per container)	PROPOSED (Based on 13 trips per Pallet)	PRESENT	PROPOSED	PRESENT	PROPOSED	PRESENT	PROPOSED	PRESENT	PROPOSED	
$ 0	$695.00	785.00	245.00	1308.00	654.00	785.00	130.90	2878.00	1724.80	$1153.20
94	53.30	136.00	20.50	114.00	57.00	68.40	11.40	412.40	142.40	270.00



Steel bundles are unloaded from gondolas using this sheet grab with hand wheel at end.

CRANES, SHEET GRAB, STEEL BUGGIES

FROM SHEET STEEL TO SCRAP— BY CRANE

By GEORGE H. JOHNSON
Plant Engineer
The Atwood Vacuum Machine Co.,
Rockford, Ill.

Crane handling of sheet steel . . . the same crane also serves the scrap disposal system, handling specially designed large-capacity buckets in temporary storage and car loading. Positioning of sheared stock by use of hydraulic lifting cylinders is another noteworthy operation.

WHILE our main plant specializes in the manufacture of automobile hardware (including some specialty items), our new building is exclusively devoted to large stampings up to a capacity of 600 tons. The building is south and just across the tracks from the old plant. A feature of the operation here is the handling of sheet steel and metal scrap (chips, turnings and stampings).

It's a modern all-steel one-story structure with a floor space 150 feet by 315 feet, and it was our aim from the first to have an equally modern handling system for the sheet steel and the heavy tonnage of metal scrap developed.

Strips from shear slide over skid onto buggy positioned on the leveling platform.

The north bay is devoted to steel receiving and storage, and is served by a traveling bridge crane of 7½-ton capacity with a 60-foot span. The crane bay extends the full 315-foot length of the building. A railroad spur track enters it through a door at the west end and is 150 feet long. While crane handling of incoming sheet steel was planned from the first as a matter of course, we at the same time located other operations for overhead handling within the same crane bay.

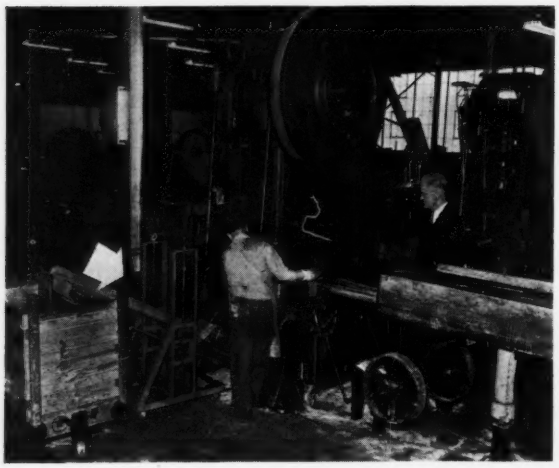
One of these is the square shear, a key department. We buy all our stock in sheets and shear from that stock according to requirements as they arise. We feel that this method is economical, uses less storage space, and requires less investment in stock. The other crane operation concerns scrap handling for which specially designed buckets are used. We will consider each of these operations in turn.

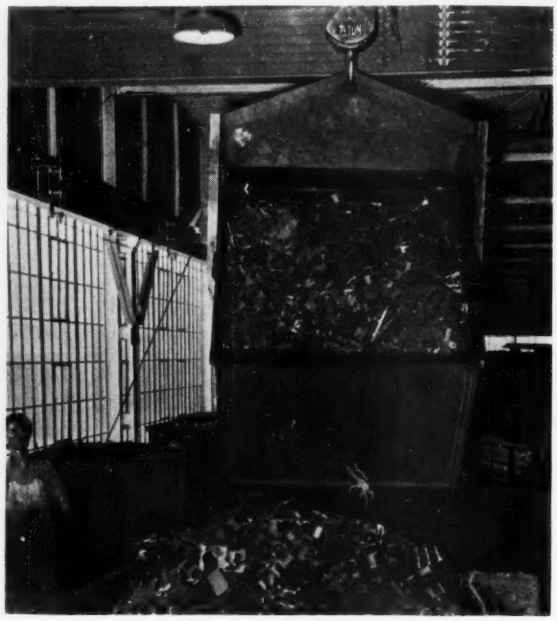
Receiving, Storage, To Production

As indicated, the gondolas of sheet steel arrive under the span of the crane through a door in the west wall, and the bundles are removed either by use of cable slings or a sheet grab. The latter has a hand wheel at one end for adjusting the jaws to the width of the bundles. The cab-controlled crane deposits the loads on the stockpiles in the eastern portion of the bay, where the material is stored to a

height of 10 feet or more. Approximately 2,000 tons of sheet steel are thus handled each month.

When the material is needed for the shear, the crane places the lifts on a steel buggy positioned at the machine. The removal of the sheared stock involves an interesting use of gravity, illustrated in one of the photos. The strips are deposited on an inclined table or metal skid that is adjusted by means of a crank conveniently located at one side of the shear.





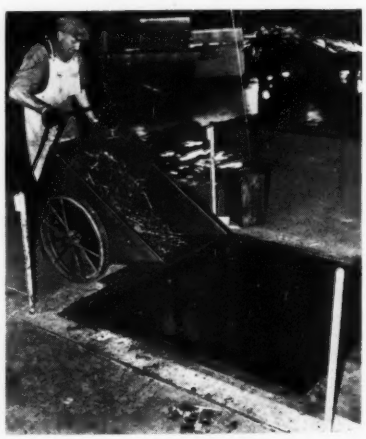
Sheared stock buggy elevated on cylinder, at right, at top. Blanks travel to box truck, left. Arrow points to scrap cart receiving trimmings. Author G. H. Johnson, standing, has engineered positioning and scrap handling devices used. Photo at right: Scrap bucket discharges load when locking device is tripped, then turns right side up.

At the discharge end of the latter the material receiving buggy is positioned on a hydraulically operated leveling platform installed in a pit. The cut material slides down over the inclined skid onto the buggy, likewise the trimmings. The scrap is deposited by the operator on another buggy spotted directly behind him at floor level.

The purpose of the skid on the shear is to transfer the stock to the far wall of the buggy and to form a pocket to confine the strips to an orderly stack. The skid is then moved back and the process is repeated until the carrier is loaded. The usual load is about 6,000 pounds. One man now has an easy job taking care of the trimmings and operating the skid, whereas previously it was a heavy job for two men to load the trucks.

When the steel buggy in the pit has been loaded, it is elevated to floor level and pushed to the blanking presses located across the main aisle in the adjoining bay. (The truck loads of long trimmings from the square shear are moved to a nearby scrap shear, located adjacent to a pit.)

The 26 buggies used for the sheared stock are fabricated of welded steel. The beds are 30 inches above floor level, and are 30 inches wide and 93 inches long. The side walls are eight inches high and 72 inches long. When the truck is being loaded (on the leveling platform in the pit) the skid arms straddle the side walls and rest on the truck top. When loaded, the top strips are at the right height to support the strip for blanking on the small presses.



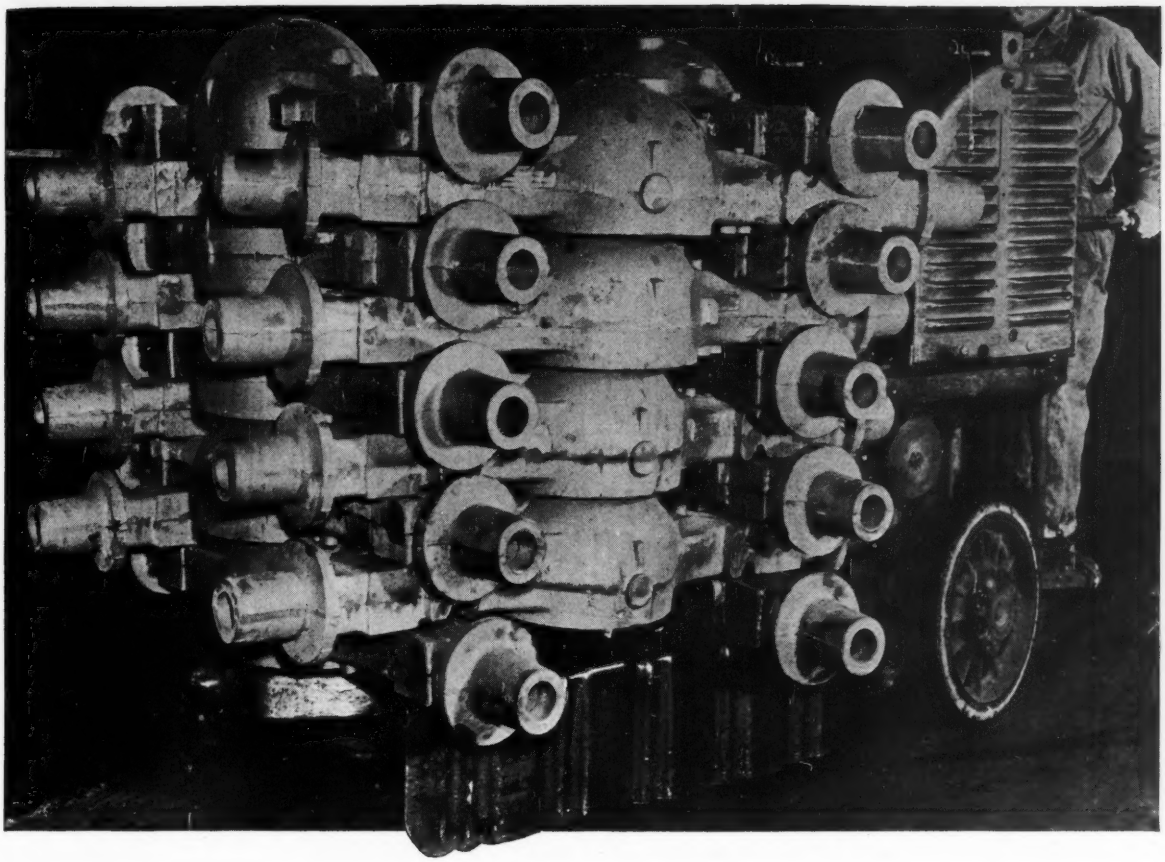
Scrap buggy being emptied into bucket installed at convenient locations in pits.

Positioning Eliminates Handling

At the blanking presses another positioning method is usually observed with interest by visitors to our plant. This method is also illustrated in one of the photos. At each blanking press a hydraulic lifting cylinder is located. The individual buggy with its 6,000-pound load is centered over the cylinder, which then elevates the load so that the sheared strips can be fed off the buggy into the blanking press. The advantage of this method is readily appreciated. It avoids the necessity for taking the material off the buggies and placing it on blanking tables, the traditional method. This would have meant extra muscular effort for an extra handling of thousands of tons of steel over a period of time. Consideration of proper positioning has made such effort unnecessary.

In all, 16 4⅜-inch hydraulic lifting cylinders are in use, and these are served by one hydraulic unit. There is a push button switch for each press, requiring a constant pressure to keep it engaged. This arrangement makes it impossible for the operator to leave the motor running when not in use. In order to raise the truck, the exhaust valve must be closed and the pressure valve opened, and the operator must hold his thumb on the push button to keep the motor running

(Turn to page 66)



It's easier to handle odd-shaped parts with

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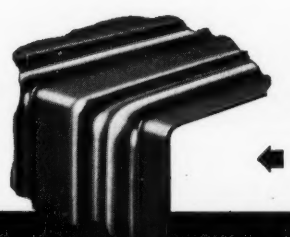
skids, boxes, pallets



. . . Note the deep, ***DoubleCorrugations*** ***(an exclusive Union Metal feature) — giving the strength and rigidity necessary in a unit of this type.***

PICTURED above is a typical example of the many jobs Union Metal materials handling units do—safely, easily, quickly. Those odd-shaped truck axles are being transported on a Union Metal Double-Corrugated Skid, efficiently and economically.

In busy plants everywhere, on all kinds of jobs, these materials "handlers" prove that they SAVE TIME . . . SPEED PRODUCTION . . . CUT COSTS.

That's because these rugged units are engineered to move, store and handle raw materials or finished products in unit loads. They help maintain production schedules—keep valuable floor space clear.

Find out how these long-lasting, versatile skids, boxes, or pallets can *cut your materials handling costs.* Most requirements can be met with standard designs; hard-job problems solved with "specials." Complete information and helpful engineering service furnished promptly. Write The Union Metal Manufacturing Company, Canton 5, Ohio.

UNION METAL

Materials Handling Equipment

A PAPER ON THESE OR RELATED SUBJECTS MAY BE A PRIZE WINNER!

TO stimulate greater interest in the development of material handling cost control methods — a subject of vital importance to industry — FLOW is sponsoring the industry-wide "Cost Facts" Contest. Papers may be entered which describe any type of installation of material handling equipment, regardless of size, that has saved money. Since this is a contest based on facts, grammatical skill will have no bearing on the decision of the judges.

Papers submitted (they may be of any length) will be judged on (1) the analysis of the cost factors entering into the installation described, with details of the methods used in measuring cost savings. (2) the evaluation of the efficiency of present methods over past methods, and (3) the technical accuracy and completeness of the entry. Pictures, charts and layout drawings are necessary to the cost analysis presentation.

WHAT MAY BE ENTERED

Manuscripts may describe the cost factors entering into any type of material handling installation for either an entire plant or a single department.

WHO MAY MAKE ENTRIES

This competition is open to an employee or engineer of any company EXCEPT manufacturers or distributors of material handling equipment. Members of the FLOW staff cannot compete.

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CONTEST EDITOR
Flow MAGAZINE
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CLEVELAND 13, OHIO

PACKAGING MECHANICS

Beginning a new regular monthly section in which will be presented solutions to the problems of efficiently filling and handling the boxes, cartons, bags, bottles, cases, etc., used in commerce and industry.

More Packaging Production In Less Space

Here are two different conveying methods used in packaging two types of greeting cards. The savings obtained in terms of man-hours and floor space show that modern handling methods pay.

By R. C. RICK, Production Manager
and
R. W. BELT, Industrial Engineer
American Greeting Publishers, Inc., Cleveland

AMERICAN Greeting Publishers, Inc., Cleveland, streamlined the packaging of its holiday assortment (100 cards in eight designs to the carton), through three successive stages, with the following results:

	Original Method Table	*First Improved Method*	*Present Conveyor Method*	*Change from Original*
Floor Space Per Oper.	300 Sq. Ft.	80 Sq. Ft.	80 Sq. Ft.	73% Decrease
Walking Per Oper.-Hr.	450 Ft.	———	———	100% "
Prod. Per Oper.-Hr.	8 Units	11.5 Units	13 Units	63% Increase

Here are the highlights of the original "table" method used. One design was interleafed (placing the envelope in the card), and the material was then held in temporary storage. This was the procedure for each of the eight designs making up the full assortment. When the scheduled quantities for the eight designs were completed, the stock boxes (containing 1,000 cards each) were moved from storage to the tables for making the assortments.

The required number of each design was placed on a table. A girl then went around the table and gathered up sufficient quantities of each design to make up the assortment. In this operation, five girls did the interleafing and one girl made up the complete assortment.

This method, in use some time ago, was subjected to study by our company's industrial engineering department. Aside from extra handling of the stock boxes in and out of temporary storage, the on-the-floor storage of work in process required an excess amount of square footage. Each skid took up 15 square feet and for service purposes an additional 15 square feet were needed. Another difficulty was the time consumed in locating the proper components that went with each design. With hundreds of different designs being handled throughout the year, the location factor proved very troublesome at times.

The second step in the gradual improvement program was as follows. Eight girls were seated at both sides of a packaging table, with one operator at the head end. She placed empty cartons (end to end) in the frictional chute that was in the center of the table, approximately one foot above the top. Each packaging operator filled the cartons only with cards of her design as they moved past her station. The cartons were advanced in a solid line one box length each time an empty one was added at the feed end. This operator, incidentally, also folded the cartons, and her pace was approximately the right timing for the interleafing operation performed by the four girls on each side of the table. An operator at the foot end of the table placed the covers on the cartons and disposed of them in shipping containers that were spotted on a skid.

After this change had been made, we realized that production could be improved and the work simplified by replacing the friction chute in the center of the table top with a wheel conveyor. This arrangement is shown in one of the photos.

The number of operators is still the same. The girl at the head end

also feeds the empty cartons to the line (unless cartons already set up are used, in which case the interleafing operators supply the cartons themselves).

Above: This wheel conveyor on packaging table was installed as final flow improvement.

The big saving resulted from putting the assortment directly into the cartons, thus avoiding the intermediate handlings to and from the bulk stock boxes. The use of the wheel conveyor, which made it easier to push the cartons along, constituted an additional refinement which contributed to the over-all production increase.

The shorter runs are packaged on the wheel conveyor just described. For the longer runs we use powered belt conveyors. A typical example is our box assortment which contains 20 cards of 20 different designs.

The use of the progressive "assembly line" method produces more than 1,000 cartons an hour, which represents a production increase over the former method that is conservatively estimated at 65 per cent. The accompanying table shows these and other improvements that were obtained. The reason for the saving of floor space is of course that conveyor packaging concentrates a larger group in a smaller area, thus avoiding the spotting of numerous loads around several stationary tables.

This particular conveyor belt, 30 feet long and 15 inches wide, is powered by a one-half h.p. motor and usually travels at the rate of 30 feet a minute. While there are some variations in detail, depending on the type of cards packaged, the following description is typical.

The operation may involve a total of 17 or 18 people, including two stock operators, one of whom supplies the material to the stock bins on each side of the line. Fourteen girls are seated along both sides of the conveyor, and one at the feed end.

The girl at the head end places the cartons on the line, while No. 1 operator adds the dividers. Operators No. 2 through 5 each add five envelopes apiece. Why has this step been split up over four operators? Five envelopes can be counted at sight, making the operation almost automatic and at the same time accurate. This number of girls is also required for the volume handled on the line.

Operators No. 6 through 10 put in the cards, each girl adding four of the same number of different designs. The stock for each girl is supplied within easy reach in bins placed on a small table. No. 11 places the covers on the cartons, while No. 12 places the boxes in shipping containers at the end of the line. Depending on the type of item run, two additional operators

Below: For long runs (assortment of 20 different designs) a powered belt conveyor is used.

	Original Table Method	*Present Belt Conveyor Method*	*Change*
Floor Space Per Oper.	**324 Sq. Ft.**	**74 Sq. Ft.**	**76% Decrease**
Walking Per Oper.-Hr.	**400 Ft.**		**100% "**
Production Per Oper.-Hr.	**45 Units**	**77 Units**	**71% Increase**

(No. 13 and 14) may be needed for sealing the cartons and disposing of the stock on skids, though occasionally one is sufficient.

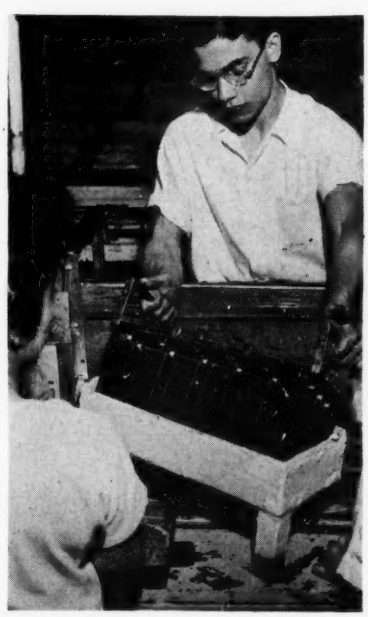
The principle is of course the same in both types of operations. That is, walking on the part of the girls around stationary tables is avoided and, instead, the work moves on a conveyor between two rows of operators, each performing a separate step in the progressive packaging assembly. While the application of this method was a novelty as far as our industry was concerned, when we adopted it some time ago, we know that it pays. The figures in this description give ample support to this point.

COMPRESSED AIR AIDS IN THE FAST PACKAGING OF ICE CREAM SUCKERS

Product protection is assured by quick transfer to the hardening room via chute.

AMERICANS consumed 475 million gallons of ice cream in 1946. A popular form of this product is the "sucker", which is frozen on a stick and encased in a parchment bag. One Eastern dairy packages as many as 70,000 units in a single day during the warm season.

While this procedure is fairly standardized for large dairy firms, smaller companies may benefit from this description, or it may be helpful to concerns in other fields with similar packaging problems. Of interest is the use of compressed air to keep the bags inflated for rapid insertion of the suckers, and disposal by chute of the packaged product to the hardening room.

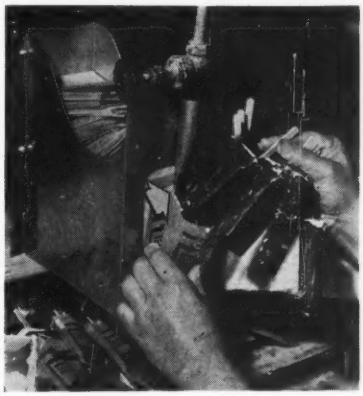


Operator releasing suckers from holding rack into dry-ice-filled tray at bagging station.

After the ice cream has been frozen on the sticks, the stick racks arrive at the chocolate dip tank, which is positioned at the head of the packaging line. Each rack holds 24 sticks. After the dipping operator removes the coated suckers from the tank, he slides the stick rack through a chocolate hardening tunnel (a stainless steel trough lined with dry ice along the bottom). This tunnel parallels the packaging line for approximately 12 feet—the space taken up along the conveyor table by the bagging operators. The material is supplied from one side of the table, and all bagging and packaging operations are performed on the opposite side. The table is 28 feet long with a 16½-inch rubberized belt in the center. The belt travels at 13 feet per minute and extends the length of the table except for 50 inches at the foot. This area is used by the last operator in the line, who seals the cartons.

Three operators remove the stick racks from the chocolate hardening tunnel and supply the baggers. The suckers are released from the racks into bagging trays by pulling a trigger mechanism. These trays, lined with dry ice, are positioned to the right of each of the four baggers.

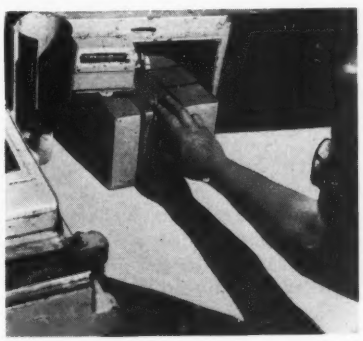
Each station is served by a compressed air outlet (see photos) so placed that the constant air pressure keeps the first bag in the holder inflated. The holder has a capacity for 500 bags and a spring mechanism keeps the bags positioned properly under the compressed air outlet. This arrangement enables the operator to insert a sucker in the bag with one hand and place the bagged product on the conveyor with the other hand.



Bagging operator inserting suckers into air-inflated paper bag. Note air outlet above bag.

The holder is attached four inches above the table to provide a convenient working height for the bagger.

One box maker is stationed next to the baggers. She sets up the carton flats and places the containers on a shelf that is 16 inches above the packaging table. Six packers, next in line, place two dozen suckers in each box. Note that the same multiple of two dozen is used throughout the operation. (This is the number originally supplied to the line from each stick rack.)



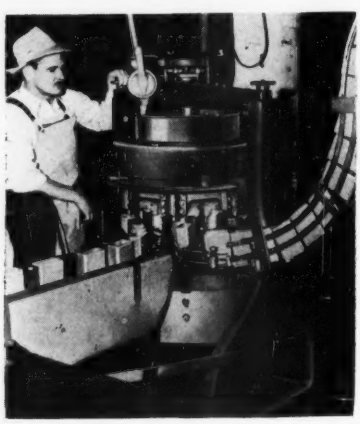
Sealer about to dispose of cartoned suckers into chute at end of sucker packaging line.

The last operator in the line seals the cartons with gummed tape which she obtains from a machine at her left. Holes in the containers, provided for ventilation purposes, also serve as a "grip" for the taper. As each carton is taped the girl disposes of it by sliding it across the table into a chute that terminates in the hardening room. A mechanical counter checks the cartons as they enter the chute. This count must tally with the daily inventory record taken in the hardening room. The suckers are left in the hardening room for a minimum of four hours, and are removed by hand truck to the shipping platform for loading into refrigerated trucks.

The fast, progressive packaging method, aided by the use of compressed air and instant disposal by chute, enables the dairy to maintain both high production and high quality standards.

Plunger Filler

A high speed filling machine for standard size, semi-rigid frozen food cartons with metal ends has been introduced by the Food Machinery Corporation's canning machinery division. The machine, a 6-pocket plunger filler, is designed to handle up to 180 or more cartons a minute. A special feature called



"No-Can-No-Fill," shuts off the machine when there are no containers under the filler spouts, according to the release.

Operating in a rotary fashion, the filler receives and discharges the cartons in a single line. A special container feed automatically conducts the cartons onto a disc-feed. As the filling mechanism re-

volves, cartons feed to the machine, registering under each filling nozzle. A measuring device controls the amount of fill for each carton. The company states that fillers of this type can be designed to serve practically any filling requirement.

South African Authorities Urge Better Packing

ATTENTION of manufacturers, packers, and shippers of merchandise intended for export is called to the complaints that have recently been received from harbor and railway authorities of South Africa regarding the large number of frail packages, and packages which afford insufficient protection to the contents, regularly landed in bad condition by ships from United States ports.

Particular mention is made of the cartons for tinned or glass-packed foods which are not strong enough for the weight carried. It is estimated that 25 per cent of these packages are landed in damaged condition—sometimes so much so that the contents must be unloaded in bags.

The South African authorities, in their complaint, stress the fact that no responsibility is accepted by them for damage to contents of frail packages landed from ships, and that representatives of consignees are refusing to accept them unopened and uninspected, insisting that all packages which appear to be damaged or to contain broken glass, be examined, broken glass removed, contents repacked, and the cartons reconditioned. This process requires much time and results in congested conditions at the harbor sheds and a slowing up in the handling of other cargoes.

For many years the Department of Commerce has stressed the importance of adequate packing of merchandise. It has emphasized that it is an economic waste to spend time and money to design, manufacture, and package a product if, through lack of attention to proper packing, that article is later damaged or rendered completely useless or unsalable by the time it reaches its destination.

Wide distribution also was made of the Department's publication entitled, "Modern Export Packing, 1940," a comprehensive manual describing the basic principles of packing export merchandise. This book was prepared to acquaint shippers with tested and effective export packing procedures, as a result of the criticisms by foreign importers regarding some United States methods of export packing.

Copies of Modern Export Packing, 1940 (Trade Promotion Series No. 207), are available from the Government Printing Office at $1.25 per copy. A revision of the 1940 edition is contemplated in the near future, as many noteworthy developments in methods of packing goods for export have been accomplished and a number of new products have been put on the market since its release. In the meantime, information on the correct packing of specific products may be obtained from the Department of Commerce.—*Foreign Commerce Weekly.*

You can profit from these seven ideas...

1. a monthly capacity of 5,000,000 pounds with an 8-hour shift
2. mechanical propulsion of stock trucks by drag chain
3. production control by use of standards for order picking
4. a two-hour limit for orders being processed
5. a zone system that contributes to rapid stock selection
6. supply of empty shipping containers to packers by overhead chain conveyor
7. simplification of order forms and centralization of office

View of drag chain. Main aisle is painted yellow and has an order selection lane on each side.

Final packaging: overhead conveyor supplies empty containers; belt line moves out the full ones.

Mezzanine: containers are stitched, weighed, then travel to first-floor for sorting, shipping.

... WHEN YOU RE

By J. H. WAGNER
Warehouse Manager, Service Division
Thompson Products, Inc., Cleveland

IN MARCH of this year Thompson Products, Inc., Cleveland, completed the gigantic revamping job of its warehouse for its diversified line of 13,000 different automobile replacement parts. Major innovations included the change from a four-story operation to a one-story layout and mechanical propulsion of stock trucks instead of pushing by manpower. Other points of the revised method and procedure are listed in the box on these pages.

The several types of conveyor lines, overhead and on-the-floor, are shown in the flow diagram on these pages. Some of these lines serve for certain types of orders—for jobbers and branch houses, for example—and will be so indicated during the discussion. As can be seen from the flow sheet, the central portion of the 425-foot-long order selection area is served by the drag chain that propels the stock trucks. The narrower portion of this space is 93 feet wide, with

an 8-foot traffic aisle in the center and 2½-foot-wide order selection lanes at either side of it. Twenty-five-foot-deep order selection bins are located on each side of the center aisle. The wider part of this area is 144 feet wide, with stock bins located both between the two parts of the drag chain and along both walls. The flow of commodities is from north to south.

Basic to the stock selection operation is the use of the zone system. That is, the entire area is divided into four zones, and each stock clerk confines his activities to one of these exclusively. In this manner he becomes a specialist on the items he selects—pistons and pumps, for example. (Imagine he were required to be familiar with all 13,000 parts stocked!) His intimate knowledge of the products in his area enables him to make the selections in the shortest time possible and to avoid extra walking and searching. This is a big factor in the operators' productivity. To facilitate the operation, the items on the forms are arranged according to zones. They are also listed in part number sequence, which is another means of assuring the shortest possible man-travel in stock selection. When a clerk has completed his part of an order, he releases the truck to the next zone. When the order has been completely assembled, the rubber-tired and castered truck is hooked on to the over-head drag chain and towed to final checking.

Some of the 7300 lineal feet of steel shelving used. Open-front tote pan is a great time saver. ▶

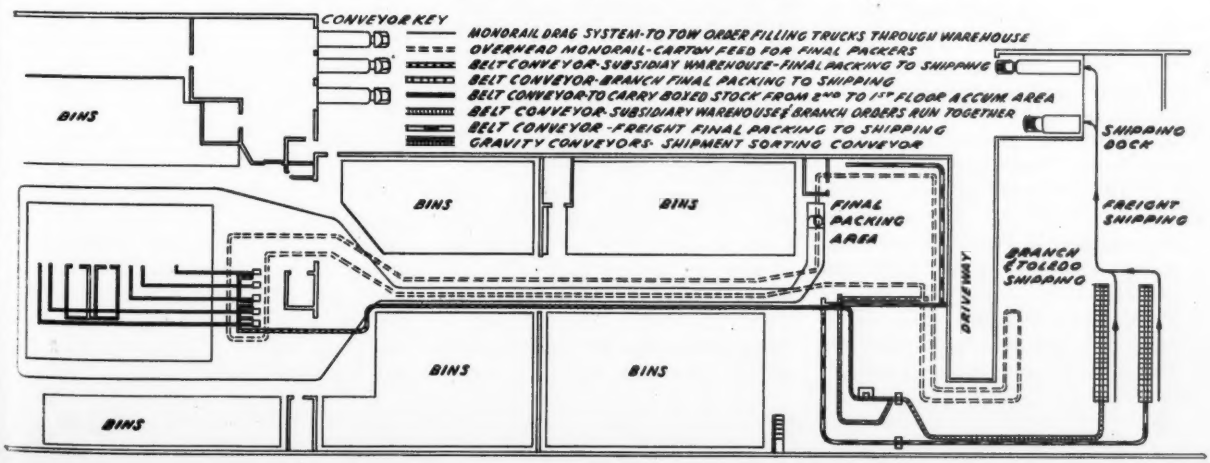
U·REVAMP YOUR WAREHOUSING OPERATION

The trucks are of the shelf type, as shown in the photos, and are 20 inches wide, 48 inches long, and 40 inches high. Each unit is equipped at one end with a mast and a hook that has a safety catch. The hook is threaded through the rings suspended from the traveling chain at 10-foot centers. Each of these trucks can support a 2,000-pound load, and usually about 100 of them are traveling around the 873-foot-long closed circuit of the over-head chain. The chain travels at the rate of 32 feet a minute and is driven by a 7½ h.p. motor.

Methods Engineered to Equipment

Certain details of method in connection with the drag-chain system deserve elaboration. The system makes tonnage production possible as well as an easier operation because manpower haulage of individual trucks is eliminated; but efficient and economical operation of the equipment is necessarily de-

Simplified flow diagram indicates various conveyor lines for different types of shipments, operations.



pendent on proper methods that must be engineered to any new procedure.

1. To hold walking on the part of operators to a minimum, fast-moving stock items are located on the steel shelves nearest the aisles, while other items are in part number sequence. 2. The eight-hour shift is divided into four two-hour periods, and during each such period a card of a different color is placed on each stock truck. This means that all merchandise started in a given two-hour period must be picked, packed and shipped within that time. For example, if there should be a solitary stock truck with a white flag during the "orange period", supervision would know instantly that an order has been delayed. This control of the time element enables us to render uniformly fast service to our customers.

3. Changes in the paper work were likewise made in order to obtain maximum benefit from the new system. Involved here too is the centralization of the warehouse office. During the time the warehouse was still located on four floors, the orders were obtained by the clerks from an office on each floor. Now there is one central office in the east portion of the area and from here all orders start.

Under the old method, a vexing and constant problem on orders for jobbers was the time and effort consumed by stock clerks looking into empty bins for material that was "out." Now arriving orders are checked against a back order list, and only those items are shown on the stock clerk's copy which are known to be on hand. The nine-part form is made out at one time, also the shipping label, and the bill of lading is started. All three parts move out into the warehouse at the same time and the shipping desk has all the necessary material. When the order is returned to the central office it is stamped with the shipping date, and thus this form serves as a complete record.

4. Of particular interest in this connection are the standards developed for the order picking operation. The three groups of factors developed for this purpose are listed on these pages. The standards, it must be emphasized, are based on the zone system—the fact that each stock clerk is a specialist in his own area and that he knows his products well. The standards that were used previously in the multi-story buildings had allowed time for a man to roam the whole building and push his truck on the several floors. And in those days each man had to pick any of the 13,000 different items.

Factor "A": ORDER; Factor "B": ITEM; Factor "C": PIECE

Factor "A"

Includes:

(1) Obtain order from shelf truck and study picking instructions.
(2) Check off known back orders before starting to pick.
(3) Sign picking form upon completion of order and release truck for checking.

Factor "B"

Includes:

(1) All necessary walking to the proper bins for picking purposes.
(2) All necessary pushing of the shelf truck from item to item.
(3) All necessary walking from bin to bin or from bin to shelf truck located at end of aisle.
(4) Any necessary "writing-out" of continued order slips.
(5) Check off picked item on picking form.

Factor "C"

Includes:

(1) Actual picking time of each commodity.
(2) Any necessary breaking of a set and consequent bagging of pieces.

Miscellaneous—Factor "B"

(1) Walking to bin resulting in the inability to pick because of a "No-Stock" condition.

These factors are considered in determining standards for order filling. The same method is adaptable to other products.

Standards Measure Efficiency

Now, on the other hand, the zone system is a saving in itself. The drag-chain more than avoids manual pushing of the heavy trucks. Under the old method, after an operator had delivered his full truck to checking, he consumed time looking for an empty unit. But under the present method a clerk hardly has to leave his area. Just as the full trucks are towed away from him, the empty ones are routed to him on the outgoing line. This is done by the final packers (see flow diagram). As each one unloads a truck at his bench, he hooks the empty carrier to the overhead chain traveling near his station. In other words, the standards must be understood in relation to this new procedure.

The data are gathered from the selection or picking forms by the time study girl, who totals the number of orders picked by the man and applies the order factor. Then she totals the number of items picked by the operator and credits him with the item factor. Next she rates all pieces picked with the individual piece standards and adds the other two factor credits in order to arrive at an operator's total standard credit. This is divided by the worker's hours and gives the man's net stock selection efficiency, which is compared with our company's maximum expected efficiency and minimum expected efficiency.

This procedure leaves no room for guesswork or for a supervisor's personal evaluation of the productivity of the men. The report that is issued expresses each worker's performance in percentage figures that are necessarily without personal bias. The report is valuable as a guide in determining required help in proportion to the orders; it is also used for cost purposes (as determined from the sales forecast); it shows outstanding performance in the men and can therefore serve for up-grading purposes. It is interesting to note that the foreman feels he could not operate the warehouse without these standards. And the operators favor them because they realize that their efforts are being recognized in a fair manner.

The cumulative group total is shown in the lower left-hand corner of the form. This total is calculated by two-week pay periods, and at the end of that period a new one is started. At the conclusion of each of these periods a departmental group efficiency report is sent out to top management. This

serves as an indication and control of the warehousing operating efficiency.

Flow of Packed Containers

The checking station is located at the south end of the area (see flow diagram), and here the arriving stock trucks are disengaged by a stock boy. The orders are checked and the operators do not use the stock clerk's copy for this purpose but another order form. This avoids the possibility of the checker making the same mistake as the order picker, in case of an error.

After checking, the trucks are moved across an aisle to final packing. This U-shaped layout (belt conveyors) is also indicated in the diagram. One arm of the U serves for jobber orders, the other one for goods shipped to branch houses. An overhead chain conveyor circles this department, supplying empty shipping containers hung on throated hooks that are spaced approximately 30 inches apart. The cartons circle just above shoulder height of the final packers, who merely reach up to obtain the next shipping container. The start of this overhead conveyor is on the third floor of an adjoining building. Here the carton flats are set up, the bottoms stitched and the containers are hung on the throated hooks.

The closed circuit of this overhead conveyor measures 1180 lineal feet. The reason for this length can be seen by referring to the flow diagram. This shows that the conveyor supplies shipping containers to two packing stations. The second of these is located at the far north end of the layout where commodities are packed exclusively for one of our company's subsidiaries.

This overhead conveyor has two one h.p. drives, one at each end, with a take up at the north end. Since the line conveys empty cartons the equipment is not of the heavy-duty type. The trolleys do not run on the conventional I-beam track but in a box-type tubular section.

As the final packers (for jobbers and branch houses) complete each carton they slide it off on a 24-inch

(Turn to page 53)

A NEW FORMULA FOR FASTER HANDLING MAKES SHIPPING HISTORY

Minimum labor and equipment equals maximum in handling efficiency

The conveyor system at the McMahan & Leib Warehouse, Anderson, Indiana, stretches out into the warehouse in such a manner that it can be used for making up orders from any point in the warehouse and for delivering them to the shipping dock. But that's not all . . . the same equipment is also used for unloading materials from both railroad cars and trucks and for carrying this material through any of three doors to storage points on the second floor.

LOADS TRUCKS IN HALF THE TIME

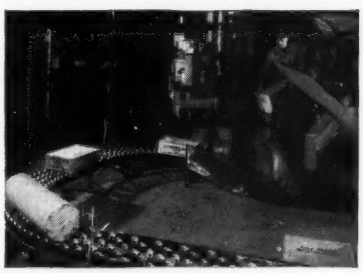
All orders are now made up and loaded on the trucks by 11:00 A.M. This enables McMahan & Leib to

(B) Floor-Veyor carries packages to second floor storage

give their customers better service and leaves the afternoon free for unloading incoming goods.

ELIMINATES OVERTIME AND DEMURRAGE

Before this installation it was frequently necessary to work many hours of overtime to get the big semi-trailers and railroad cars unloaded.



(D) Rapid-Wheel Conveyor and chute complete the conveyor circle

Now they can handle the unloading of a car or truck in such a short

(A) Stevedore, Jr. gives the packages a boost

time that they haven't had a single case of demurrage or overtime to pay.

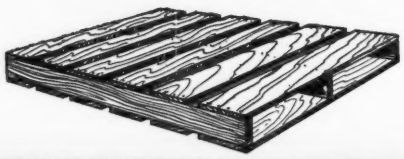
HOW IT WORKS

One man in the truck or car places the packages on a Rapid-Wheel Conveyor where they flow by gravity into the receiving room. A Steve-

(C) Rapid-Wheel Conveyor operates by free force of gravity

dore, Jr. power belt conveyor (A) gives them a boost to another wheel conveyor where they flow by gravity to a Floor-Veyor (B). The Floor-Veyor carries the packages to the second floor where they again travel by gravity to all points in the warehouse. One man in the warehouse stacks the cartons, removing them from the conveyor at the point closest to the piles (C). For filling orders, goods can be placed on the conveyor at any point in the warehouse and carried back to the shipping room through a chute (D).

For further information on these time, labor and cost saving conveyors, write the Rapids-Standard Co., Inc., 377 Peoples National Bank Bldg., Grand Rapids 2, Michigan.

ON THE  PALLET

NEWS · VIEWS · TRENDS

THE Philco Corporation has recently sold its Industrial Battery Division in Trenton, N. J., to the National Battery Company. The Philco Division has been consolidated wtih National's subsidiary, the Gould Storage Battery Corporation. According to A. H. Daggett, president of Gould and National Battery, "Gould and National Battery have manufacturing plants at all strategic points throughout the United States. The consolidated organizations will operate under the name of Gould. The name 'Philco' on batteries produced at Trenton will be replaced gradually by the name 'Gould'. It is hoped to have this transition completed within the next eighteen months."

MISUNDERSTANDINGS regarding authorization of use of metal strapping on fibre boxes have arisen in connection with the recent general change in Rule 41, published in Supplement 22 to Consolidated Freight Classification No. 17, and effective June 15.

The misimpression is that the changes in the sealing requirements in Section 7 tended to rule out use of metal strapping on all fibre containers. This erroneous idea arose because the new section of the Rule, in dealing with sealing of *Rule 41 slotted boxes only*, discontinued reference to metal strapping as a method of sealing such slotted boxes, and confined itself to authorizing use of gluing, metal rivets, staples or stitches, or paper sealing strips for such sealing. However, it is important to note that the new section does not overrule use of metal strapping as additional reinforcement after one of the specified sealing methods is used, and that the section furthermore only applies to Rule 41 boxes. Thus, Rule 41 boxes may be first glued, stitched or taped; and they may then be strapped.

It should be stressed that the omission of provision in Section 7 for sealing slotted boxes only by strapping does not affect continued use of such sealing for: (1) Other styles of Rule 41 boxes (where authorized) set forth in Section 8; (2) Many other styles of fibre containers known as "packages," "bundles," "bales," or "wrappers," which are so-called package descriptions authorized under the item to be shipped and which in sealing need not comply with Rule 41; and (3) Other styles of fibre containers or closures which may be provided by specific exception to the Freight Classification or other tariffs. On many of these special packages, bales, bundles, etc., metal strapping alone may be used for closure without the use of other sealing methods, under other provisions of the Classification.

The interpretations given above meet with the full approval of the Consolidated Classification Committee.

MATERIAL Movement Industries has been dissolved as a partnership as of May 31, 1947. Material Movement Industries, Inc., a corporation, has been formed and has assumed the assets and liabilities of the former partnership. There will be no change or interruption in operation or management.

AMERICAN Management Day will be observed for the first time this year, September 20. Sponsor will be The National Association of Foremen (now by-lined "The Management Men of America").

Composed of more than 250 foremen-management clubs in 36 states, in which all levels of senior and junior management participate, NAF's methods and procedures have now attracted nationwide attention of senior management as the only effective solution yet advanced for resolving unity in the management team—insuring that foremen and other supervisors remain on that team. Foremen constitute over 90 per cent of the entire management group.

PALMER-SHILE CO., nationally-known manufacturers of material handling equipment, are now occupying a modern building at 16000 Fullerton Ave., Detroit. The new plant was designed for maximum use of daylighting and for production of materials handling equipment. Palmer-Shile Co. has been a factor in the materials handling industry since 1914.

A COMPREHENSIVE new study of the national market for shopping lines has just been published by the Research Department of The Curtis Publishing Company. The study consists of a map outlining the 498 market areas in the United States, and a companion booklet containing statistics which measure the value of each of the market areas as a part of the national market.

Entitled "Market Areas for Shopping Lines," the report defines shopping line products as those for which a purchaser shops around and compares price and quality before buying. These items account for about 80 per cent of the sales in the average department store.

The study is designed to help manufacturers and national distributors do the following: (1) Measure the purchasing power of an area as it applies to shopping line sales. (2) Determine the most profitable distribution of advertising expenditures. (3) Establish sales quotas. (4) Allocate sales territories. (5) Measure the effectiveness of retail outlets in an area in

(Turn to page 68)

$15,000 Glass-Packed Load arrives undamaged

Helene Curtis Industries ships 18 tons of cold wave shampoo from Chicago to Los Angeles without damage . . . uses Acme Unit-Load Bands for bracing

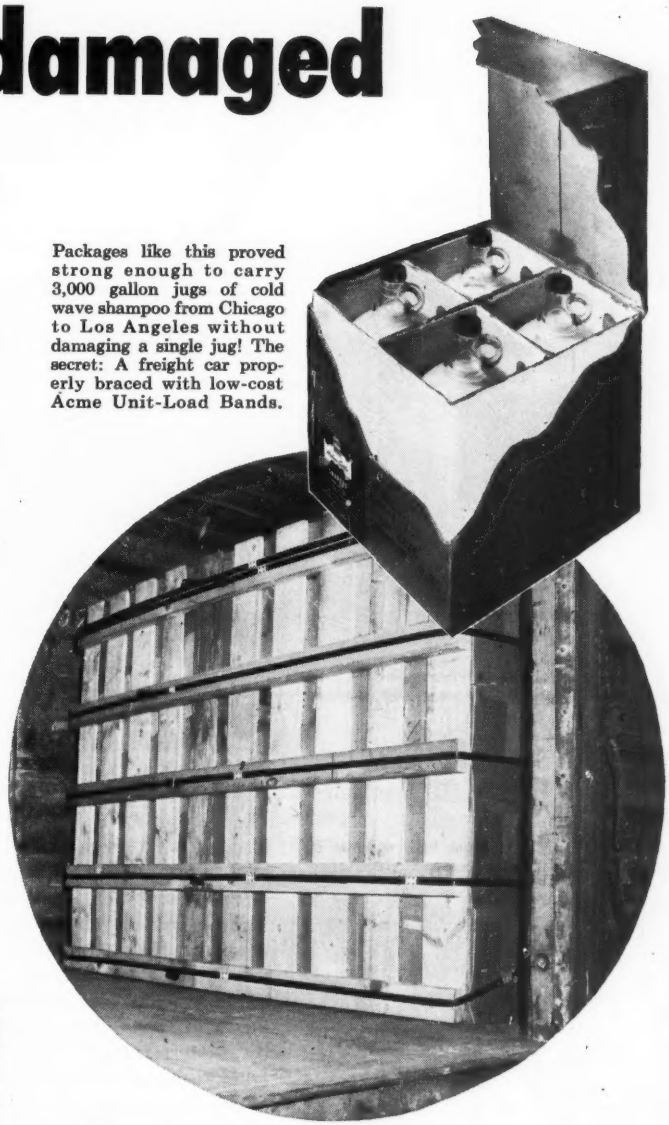
As Helene Curtis Industries, large manufacturers of beauty supplies, expanded, shipping problems grew.

Many sizes of containers required considerable study of stowing and bracing in freight cars, so an Acme Shipping Specialist was called in for advice. The successful shipment (shown in the pictures) was one result.

How About You?

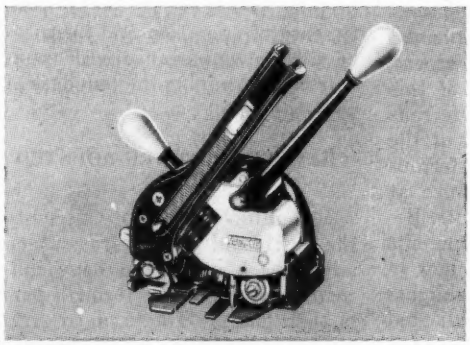
Ask an Acme Shipping Specialist about your shipping methods. He may be able to give you better shipping at lower cost.

Write or mail the coupon for a free copy of "Savings in Shipping," case histories of Acme's services and savings for many industries.



Packages like this proved strong enough to carry 3,000 gallon jugs of cold wave shampoo from Chicago to Los Angeles without damaging a single jug! The secret: A freight car properly braced with low-cost Acme Unit-Load Bands.

Here's the neat, practical way this $15,000 load was braced. There is a minimum of lumber dunnage and maximum use of space. Each carton weighs 48 pounds, and 750 cartons were carried in a car.



More savings ahead for Acme Steelstrap users— No. 3 Steelstrapper, the lightest tool made, is now available. Magazine holds 100 seals. Tensions, seals, and cuts the strap in one operation. Small base requires only 5-inch strapping surface. Two levers working in opposite directions make for better balance and easier handling.

Acme Steel Company, Dept. F-87
2838 Archer Avenue
Chicago 8, Illinois

Please send me a copy of your case history booklet, "SAVINGS IN SHIPPING."

Name.....

Company.....

Address.....

City.....Zone....State.....

ACME STEEL COMPANY

NEW YORK 7 ATLANTA CHICAGO 8 LOS ANGELES 11

HANDLIN

MOBILE CRANES, DUMP TRUCK-FORK TRUCK BARREL GRAB

Crawler-mounted crane removing lift of rails which are deposited at processing location.

Loading of lead and other bulk material by clamshell and chute has superseded shoveling.

JOSEPH BEHR & SONS, INC., Rockford, Ill., are dealers in scrap metals, rags and paper, and the company also operates on the same premises a separate division for new and used machinery and shop equipment. It is one of the largest plants of its type in the Middle West. The volume comprises, exclusive of machinery, approximately 125 inbound carloads a month, and 200 outbound carloads. The difference is explained by material received in highway trucks. The main subject of this article is the handling of ferrous metals (about 70 per cent of the volume) and some non-ferrous metals, with a passing glance at one or two other departments. Because of interesting developments for a new rag department, now in the planning stage, the highlights of this operation will be indicated as now projected.

The handling equipment employed in the yard consists of several types of mobile cranes, accessories designed for efficient handling of different types of materials, and a dump truck operating with several dozens of detachable buckets. Within the plant, handling by use of fork truck, specialized manual equipment and special load carriers likewise illustrates the principle of "the right tool for the job," according to the type of material being handled. Low-cost mass handling is naturally the objective in all operations, but in the adoption of any one method the management is equally concerned with plant safety, elimination of muscle-straining jobs, and good housekeeping. Thus the factors of safety, ease of operation and neatness have equal importance with economy in determining the purchase of new equipment.

CRAWLER AND TIRE-MOUNTED CRANES

The outdoor area is divided into the north and south yards, which adjoin each other and have railroad spurs extending through part of their length. The yards are rectangular in shape, each being approximately 500 feet wide and 1,000 feet long.

The north yard has two spur tracks, one alongside the warehouse, in which paper, rags and some non-ferrous metals are sorted and stored. This yard is used mainly for materials that require no (or minimum) sorting or processing.

N IN A SCRAP METAL YARD

In the minds of many people the term "scrap metal business" still evokes an image of "the junk yard," a preconception that is thoroughly and quickly dispelled by a visit to a modern plant of this kind. The subject of this article is an example. In 1946, the consumption of open market scrap was 20,100,000 gross tons at an average f.o.b. price of about $25 a ton. A number of dealers are highly mechanized for low-cost handling—an essential where volume turnover at narrow profit margins is the accepted practice. Many plants are replacing worn-out equipment, or are planning modernization projects for backward departments. In some instances, the multiplicity of certain types of materials handled (as in rag sorting) may involve comprehensive engineering surveys entailing considerable investment in material handling machinery. In the final analysis: scrap prices the country over are fairly well standardized, requiring dealers to pay pretty much the same prices. Hence, the avoidance of waste time and effort during handling in the plant or yard is the key to profits. And hence competitive strength in this industry, as in any other, is dependent on low-cost, correctly engineered methods designed for the products and the volume handled. The present description reflects the advances achieved by a leading concern in its field, as well as some of its problems for which it is finding solutions.—Ed.

Examples are castings or rails which arrive in solid carload lots. While rails are cut to steel mill specifications, the handling of other types of materials consists of straight unloading and loading.

The stockpiles are built parallel to the track on both sides, and the incoming cars are spotted along the piles where the material will be unloaded. The handling in this area (east) is done by a crawler-mounted crane with a 40-foot boom. Depending on the nature of the material, this equipment will use a lifting magnet, a clamshell bucket or an equalizing sling. The last-mentioned below-the-hook device is used for heavy castings or machines that are stored near the center part of the north yard.

Another type of mobile crane, also shown in one of the photos, is mounted on solid tires. While it is also used in connection with car loading or unloading operations, it is frequently employed in servicing inbound or outbound highway trucks at the extreme western part of this yard. The mobility of both cranes, plus the specialized attachments, results in a flexible operation that permits each type of material, in any part of the yard, to be handled without manual effort.

FAST LOADING OF BULK MATERIALS

The crawler-mounted crane is employed in another operation that merits some detailed description. Located near the western part of

At left: Efficient volume handling of cast iron borings by lifting magnet and tire-mounted crane. Below: Dump truck with demountable body has enabled company to render service to its customers.

the north yard are storage bins for non-ferrous metals such as aluminum turnings and battery lead. For loading purposes of this bulk material, the crane spots a specially constructed chute so that its spout extends about halfway into the outbound box car. Using a clamshell bucket, the crane loads this material into the chute, and it is thus discharged into wheelbarrows spotted under the spout. The loads are then wheeled to the ends of the car for dumping. This chute-and-crane combination has increased production during loading considerably.

Cast breaking to mill specifications—one of many jobs performed by locomotive crane.

To gain an idea of the improvement represented by the present method, here is how the same operation was performed previously. Aluminum turnings, for example, were shoveled from the ground-level storage bins onto the floor of the box car. From here the material was shoveled and piled into the ends of the car.

With the shovel-by-shovel method, it took two men a full day to load a car, whereas the crane now does the same job in two hours. The saving in time is not the only advantage, it will be noticed. The shoveling from the ground to the car floor required heavy physical exertion, and its elimination is considered an important contribution to safe practices by the management.

A before-and-after comparison of loading battery lead is equally illuminating in regard to what can be accomplished with the application of a little study to "customary" practices. The same method for battery lead, it should be explained, also involved the purchase of new battery breaking equipment of the latest design. The old loading method, figuring both breaking and loading, required about 2½ days per freight car, whereas the crane-and-chute operation now accomplishes the same task in one to 1½ days. Note how the application of mobile crane handling to this operation depended on someone's thinking of the construction of a chute for boxcar loading purposes. Once this simple device was thought of and made, the crane could be put to another use, which was responsible for fewer demurrage bills and a saving of untold man-hours.

BARREL HANDLING BY HAND AND FORK TRUCKS

Adjacent to the storage bins for non-ferrous metals is a loading dock over which turnings of brass scrap in barrels are moved from the warehouse to the outbound cars, where this material is dumped. In this instance, again, the operation was studied and consistently improved until a satisfactory method (from the standpoint of unit production per manhour and safety) was developed.

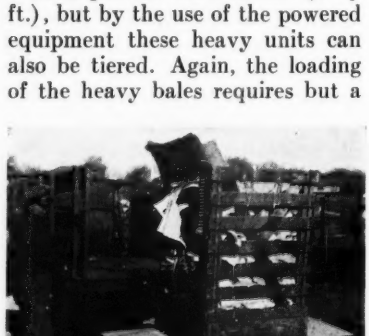
Safe, speedy handling of certain materials is possible by use of barrel grab for dumping.

Barrel hand-trucks are used for moving barrels weighing up to 1,000 pounds, the distance of the haul being about 75 feet. Containers of this weight are handled readily with this specialized equipment. For barrels weighing between 1,000 and 2,000 pounds, the fork truck is employed, as shown in one of the photos. For this purpose, a boom attachment is used in conjunction with jack hooks at the end of a chain sling. The boom attachment is applied in a matter of minutes. Production per manhour has increased by leaps. However, further scrutiny of this handling revealed the advisability of a chain-type barrel grab that grips the barrels near the base, facilitating the dumping of the containers. This accessory will soon be in use.

The old way: Before this specialized equipment for barrels was purchased, both manual and powered, "it required crews of two, three and even four men to wrestle with these containers," in the words of Secretary-Treasurer Benjamin Behr. "The job of dumping by hand called for exceptional exertion on the part of the men," he explained. "We feel that the improvement in safety with our present method is the most important consideration."

Today's production: Previously, it took as many as four men up to two days to load a car, whereas the fork lift truck operator with one helper will only use up to a maximum of seven hours.

Fork truck handling is involved in several other operations. An example is non-ferrous metal in long strips, which is baled in 72-inch bales weighing from 1,500 to 3,000 pounds each. The compressed bales make possible an appreciable saving in space. One bale may contain enough material to fill as many as 15 barrels, which take up approximately 80 square feet of floor area. A bale will not only use a small part of this amount (6 sq. ft.), but by the use of the powered equipment these heavy units can also be tiered. Again, the loading of the heavy bales requires but a fraction of the time that was consumed with "loose" handling in barrels.



Hydraulic lift gate loads paper and rags by the crate. Tedious hand loading is avoided.

Another item in this connection is a wooden pallet crate, 53″ x 38″ x 38″ which is used for bundles of

paper. If supply plants of such materials have a ground-level operation, the company's highway trucks sent for pickup are equipped with hydraulic lift gates. The full crates, previously loaded by the supplier, are wheeled up to the lowered gate and placed on it. Hydraulic power then lifts the loads (the maximum is 1,500 pounds) to the level of the truck bed. In this way, the job is made easy, safe, and efficient.

Prior to the present crate and hydraulic lift gate operation, the men used to have to pitch the individual bundles (or loose stacks) manually from ground level onto the truck. Loading by such means took two men an average of five hours per 10-ton truck. Now two men perform the same operation in 20 to 30 minutes. This saving applies, of course, both to loading and unloading. Within the plant further economies are obtained because the crate-loads are moved and tiered by fork truck. This equipment, incidentally, also handles bales of rags.

LOCOMOTIVE CRANE IN THE SOUTH YARD

To the crawler-mounted and tire-mounted cranes operating in the north yard must be added the locomotive crane that serves the south yard. The general layout of the latter is the same as that of the north yard—that is, a railroad spur divides part of the area into two longitudinal sections with storage bins on both sides. The locomotive crane is equipped with a 50-foot boom and operates on a 400-foot runway. Different attachments make this crane, like the others, a versatile tool in handling the numerous types of materials.

The south yard is the location of the cast breaking bin, shown in one of the photos. The three-sided structure is 40 feet high, 25 feet wide with side walls extending about 15 feet, and is supported by 15-inch I-beams. Its purpose is of course to prevent pieces of cast metal from flying wild under impact of the breaking ball.

The crane drops the 3,800-pound ball from a 40-foot height on the heavy castings placed within the bin, reducing the large pieces to the size required by mill specifications. The broken-up material is later loaded into gondolas by use of a 45-

inch magnet. This attachment is also employed extensively in building the stockpiles on both sides of the track. Another below-the-hook device, an orange peel grapple, is used for loading long and tangled metal materials.

SENDING BUCKETS INSTEAD OF MEN

IN THE opening paragraphs a dump truck with detachable buckets was mentioned as another part of the company's equipment. About 30 of these buckets are used in conjunction with the truck, ranging in capacity from four to eight cubic yards. The employment of this equipment has had some interesting ramifications.

In this case, as in some of the others, it would be difficult to estimate the time and effort that were saved as a result of the improved method. Prior to the use of this equipment, two or three men were sent along with a dump truck to bring in a load of stampings, for example, from a customer plant. If the men did not shovel the scrap into the truck, there was usually waiting time until the loading could be done by other means.

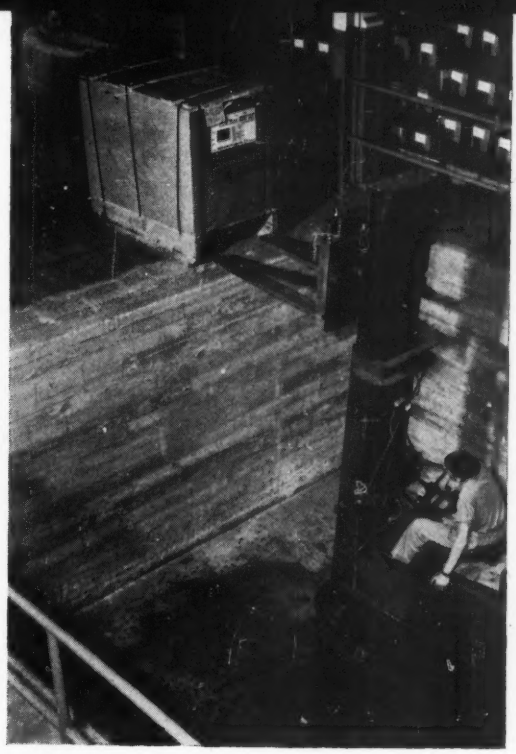
Now, instead of sending out men with shovels, the Behr company sends out buckets. These are spotted in the customer's plant for greatest convenience. The full containers are picked up by the dump truck on schedule—and are dumped in the yard in the required bins in a matter of minutes. Thus both pick-up and unloading are tremendously facilitated.

The customer plant tends to benefit just as much as the scrap collector. For example, the scrap-producing plant has a neater operation. The scrap is no longer scattered, or stored in disorderly fashion, but is confined to the containers. Plant space is saved, housekeeping is promoted, and the tendency for driveways to be congested by waiting vehicles is minimized.

In fact, this equipment has enabled the company to render valuable service to customer plants on scrap collection, which is frequently a problem. Here's an example. One plant collected scrap in trays which were handled by fork truck. From eight to ten trays were stored for each highway truck load. This

(Turn to page 70)

FORK TRUCKS, HAND TRUCKS, CONVEYORS



Hydraulic hand truck spots load "in between" receiving floor for fork truck in the pit (on first-floor level).

CONSOLIDATION SAVES SPACE, HANDLING AND DOLLARS

By R. C. RICK, Production Manager
and
R. W. BELT, Industrial Engineer
American Greeting Publishers, Inc.,
Cleveland

Problem: While new building projects must wait, existing old buildings tend to obstruct efficient material flow. Solution: cost-wise plant engineers offset handicaps by consolidating scattered operations and modernizing handling procedures. Pay-off: square footage occupied in one department was cut by 50 per cent. —This example of a leading greeting card publisher proves that it "can be done."

OUR company is one of the largest producers of greeting cards and specializes in distribution through drug stores. Production totals several million cards per five-day week. The handling operations involve heavy skid loads of paper products as well as the extremely light and small units of the individual cards themselves. *(For handling in packaging see the new section "Packaging Mechanics" page 29.)*

Until recently, our company had maintained five plants and warehouses—four in the greater Cleveland area and one in Cincinnati. These separated locations represented our major problem—extra handling because of excess interplant movement. Our industrial engineering department had been working on consolidation for some time as the solution, but this had to be done gradually (with minimum interference to current production). At the same time we studied modern handling devices and methods in relation to our old buildings and to the revamped and more compact layouts that were being planned. In other words, consolidation did not merely mean transferring departments from one building to another; it meant redesigning layouts in order to achieve low-cost handling and maximum production from minimum space. And since we had to "make do" a building that had served for a number of years, the problem was also one of overcoming handicaps that were inherent in the structure.

Over a period of time we consolidated the five original plants to two, both in Cleveland. Until spring of this year the operations were equally divided between these two plants. One is located on Berea road and the other at West 78th street, and the buildings will be so identified in this description. The final effort of the consolidation project is now being effected from 78th street to Berea. The latter plant is to house all functions eventually.

The Berea plant was purchased with this end in view and is a six-story building with a total of 200,000 square feet. It has more floor area, better ceiling height and greater floor load capacity than the 78th street plant. While the main part of this article deals with the consolidation of functions affecting birthday greeting cards, we will also discuss the solution to a problem represented by the Berea building.

Overcoming a Building Handicap

The 200,000 square feet of this plant include a covered receiving dock that is awkwardly located between the first and second floors of the building proper. Thus the receiving room floor is actually an "in between" floor. Access to the plant (and the south elevator) was provided via a 65-foot ramp that leads over a 4-foot rise to the second-floor level. This arrange-

ment required the fork truck operator to transport all incoming loads through the operating department. With the south elevator located 125 feet from the ramp, fairly long truck travel was also necessary.

This roundabout movement of the loads entailed several unsatisfactory conditions. Travel through an operating department was an interference in itself. The operators were chilled in winter when the door to the receiving room had to be left open. Moreover the arriving loads should have been delivered either to the north elevator, located 200 feet beyond the first one mentioned, or to the first-floor storage area. But access to the north elevator was not feasible on the second floor.

For one thing, the north portion of this floor is several inches below that of the south part; for another, it would have been necessary to break through solid walls in order to provide a truck aisle. But this would have interfered with a service department, and therefore was not considered desirable. It was, also, against the best interest to route all loads via the south elevator, which was busy moving material between production and storage floors. The constant overworking of one elevator left us faced with the possibility of a breakdown. This would have held up all operations.

Here is how we eliminated exclusive use of the south elevator, travel through the operating department, and at the same time made the north elevator accessible (on the first-floor level) to shipments arriving on the "in between" floor. In January of this year, we had a pit constructed, 20 feet long and 15 feet wide, at the north end of the receiving room. This was suggested by the supervisor of the Standards Division. This break-through extended the first floor directly into the receiving room, though approximately eight feet below its floor level. Now the arriving loads are spotted by hydraulic hand lift truck on the upper level along the edge of the pit. A 5,500-pound fork truck operating on the first floor picks off the loads (see photo) and transports them either to the assigned storage locations or to the north elevator. The result is that both elevators are now worked fairly evenly, and the roundabout handling of loads on different floor levels from one elevator to another has likewise been eliminated. As a further result, we now have faster flow of between-floor traffic and waiting time for elevator service has been gratifyingly reduced.

Chute and conveyor combination is used to transfer stock from sixth-floor bulk storage.

To give an idea of the volume handled via the pit: in a recent peak month 40,000 skidded pieces aggregating more than 1,600,000 pounds were moved by fork truck from the upper level to first-floor storage and the north elevator. While the construction of the pit solved a major building handicap, other structural difficulties (on a smaller scale) will be overcome by the installation of chute-and-conveyor combinations.

Benefits From Consolidation

As previously indicated, the birthday greeting card operation has been chosen as an illustration of the final consolidation effort now in effect. This item represents a sizable part of the total volume handled, and the operation is typical of what we are trying to accomplish in the over-all project.

Under the old set-up (while operations were divided between the two plants), storage of materials was maintained at the Berea road plant and they were shipped via highway trucks to 78th street for assembly, packaging, storage, order filling and shipping. The individual components consist of the cards themselves, the mounts, the file cards, and envelopes. These items were shipped in bulk form in separate containers. Just as in any other assembly operation, the object was to combine these various parts (at the 78th street plant) as required for stocking and display purposes in the familiar drug store display cabinets.

Under the old set-up, four different items came from three floor levels at the Berea plant. These loads were trucked the two-mile distance approximately every hour. The frequent shipments of the individual components resulted in considerable traffic as well as numerous rehandlings within both plants. Comparative tables given on these pages show how the moves were reduced through the consolidation project, as well as the number of hours saved.

After consolidation, a considerably more compact layout was effected for storage and packaging at the Berea plant. This left only order filling and shipping to be performed at the 78th street plant. The transfer of these last two func-

tions to Berea, incidentally, is dependent on some building changes and additions. Meantime, the consolidation already in effect has well repaid our efforts with substantial economies.

Under the new arrangement, the bulk of the material is concentrated on the fifth and sixth floors at Berea (no longer on three floors). Several improvements are to be noted in this connection. Cards from the sixth-floor bulk storage area are sent to the fifth floor via friction chute. This chute was recently installed for the purpose of relieving the elevator at this end of the plant. Another innovation is the progressive gathering of the component parts on stock trucks. The boxes of cards taken from the chute are placed on the trucks and the latter are then wheeled to the mount and file card bin locations. Here the required amounts of these components are added for each particular order. The material remains on the same truck and is then wheeled to the tables where the display mounts are prepared. The assemblies are then delivered (still on the trucks) to special tables where the packaging is performed. *(Two different packaging operations are described in "Packaging Mechanics," this issue.—Ed.)*

In addition to the appreciable saving in space, the following savings in handlings or individual moves were effected:

Old Method — Moves Per Load

(Shipping individual components)

1. Six trips by elevator. 2. Four over-the-road trucks.
3. Twenty-one moves of skidded loads by hand lift trucks.

New Method — Moves Per Load

(Shipping assembled components)

1. Four trips by elevator. 2. Two over-the-road trucks.
3. Seventeen moves of skidded loads by hand lift trucks.

Evaluation of Savings

	TOTAL
2 Elevator trips	355.6 Hours per year.
2 Truck trips	1126.0 Hours per year.
4 Hand lift truck moves	436.0 Hours per year.
	1917.6 Hours per year.

In other words, this part of the operation is centered around the castered stock trucks—load carriers that have the advantage of mobility and which therefore also avoid the wasteful space consumption resulting from on-the-floor loads held in dead storage. Instead of being on the mobile trucks (and gathered in the correct proportions), the stock was previously spread out on numerous platforms, which in turn required a lot of matching, lifting and searching. Since we pack about 35 different designs a day, this also meant a large number of skids in the elevator bays waiting for delivery to preparation and packaging. When a rush job was to be got out, it used to be necessary to make the requisitions in several places—now only in one place. Thus the new method also speeds up rush jobs.

The value of the space saving feature resulting from the consolidated bulk storage and packaging operation at Berea can hardly be overemphasized. The whole operation is now performed in less than 10,000 square feet whereas formerly the scattered functions in both plants required twice the amount of this space.

In a project of this scope various operating advantages may be expected to accrue (in addition to those mentioned) from the improvements in method and layout. For example, consolidation has also meant less supervision. The simplified handling and flow of the material has eliminated the former confusion that resulted from the practice of matching the components that came from different sources. And hence, the project has also facilitated our production to a considerable extent.

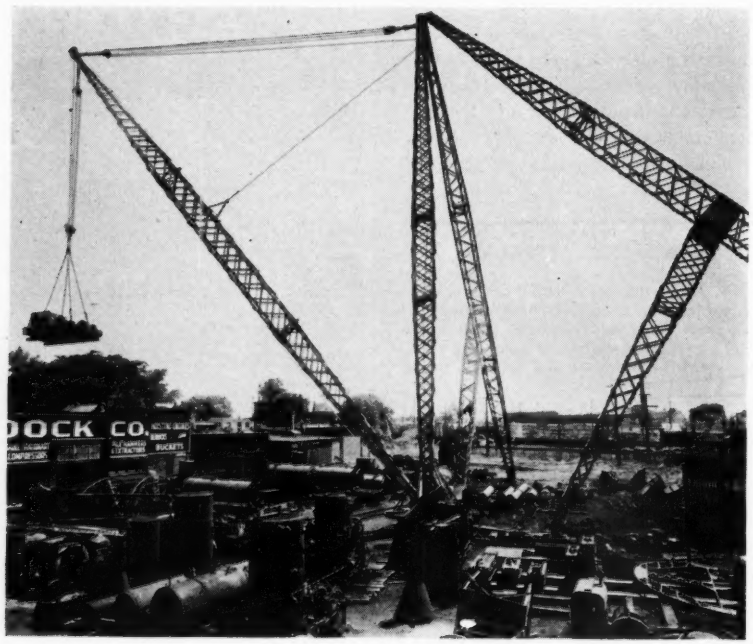
CHAIN ROPE TERMINAL

IN THE use of "skull-crackers" a common trouble is the tendency of the wire rope to twist and kink when suddenly released of all tension. The momentum of the hoist line makes it

continue its travel six or eight feet after impact. This slack in the wire rope permits it to twist and kink. This photo shows how an operator eliminated wire rope twist completely by using ordinary welded chain as the rope terminal. The chain takes the sudden slack without twisting and so holds the line steady, free of all tendency to twist or kink.

THE PLANT IS BUILT AROUND IT

Transferring load from gondola to machine shop, located at right angles to warehouse.



This stiff-leg derrick performs all handling in connection with yard storage, unloading, loading, transferring of loads—and a number of incidental tasks that are a regular part of the operations at this construction equipment sales and rental agency.

STIFF LEG DERRICK, WINCH

THE Day & Maddock Co., Cleveland, is engaged in the business of selling and renting heavy-duty construction machinery used in road building and other construction projects. Some of the equipment that is shipped or received is stiff-leg derricks, sections of which can be seen lying about the yard. But there is one derrick that does not leave the premises. It has been serving the company for a good many years.

This one is a giant with 125-foot boom, erected in the central portion of the oblong yard. This area is bounded on the north by a 250-foot-long warehouse and on the west by a machine shop. The derrick is set up equidistant from these two structures. The storage yard is located between the two buildings.

The derrick is supported by two legs and back legs, as shown in the photo, and operates within a radius of 270 degrees. It has a 90-foot mast and a 16-foot-diameter bull wheel. It is counterweighted by 80 tons of concrete in the footings.

A large part of the flow of the material is from north to west—that is, from the warehouse (or the freight cars spotted before it) to the machine shop. Here is a typical freight car unloading operation. We are assuming that a shipment of compressed air units is to be transferred to the machine shop where the equipment will be mounted on wheels.

For unloading purposes, the derrick spots a portable platform beside the freight car door, and the equipment is rolled out on this platform. The four spreader lines are of 7/8-inch cable and about 15 feet long. Usually two hook-up men make the hitches.

The derrick picks up the loads from the platform and, upon com-

pletion of a 180-degree turn, deposits them on rollers spotted on a grade height platform running the full length of the machine shop. A 5000-pound single line pull car puller then moves the equipment to any desired testing, repairing or mounting station. This is done by use of a 1½-inch manila rope in conjunction with a snatch block. The latter is hooked onto an anchor (1½-inch round stock with a ring at one end) which is dropped into 12-inch-deep openings in the concrete floor.

The derrick is also used for removing directly from the warehouse any machinery (unless wheel-mounted) which may have to be transferred either to the machine shop or loaded into highway trucks. The following typical operation is usually performed when the railroad spur paralleling the warehouse is cleared of freight cars.

Employed in this operation is a transfer car, constructed of heavy timbers, which has a 9 x 11-foot platform. The 5½-foot overhang of this car bridges the distance between the tracks and the warehouse platform. (This end is of course shored.) After the car has been spotted in front of the proper door, a snatch block is attached to the dock edge to fairlead the cable. The anchor used in this case is a section of ½-inch plate with an eye, which is secured with a bolt to the dock.

Mechanically Speaking

The derrick is operated by a 75 H.P. electric motor actuating a double friction drum. An independent swinger having a gear reduction of 105 to one facilitates swinging the long boom at maximum radius. Diameters of the cables used are as follows: ⅝" for the boom and load lines, and ¾" for the swing line. The equipment is inspected every three months for cable and sheave wear. On all moving parts special reservoirs are mounted so that lubrication once applied lasts for a three-month period.

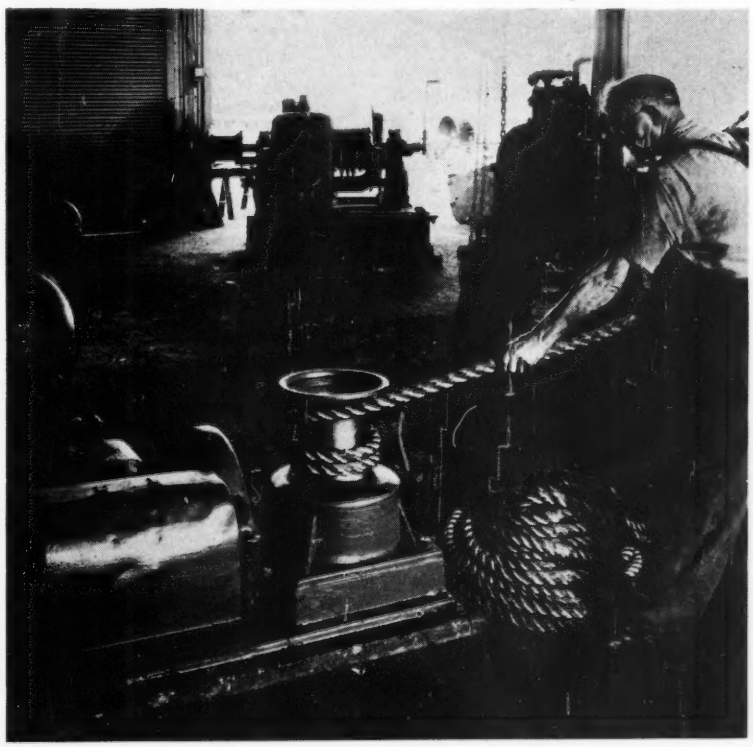
The hook is then attached to the equipment to be moved, and a vertical lift by the derrick is thus transformed into a horizontal movement. The equipment—drum hoists, steam boilers, road rollers or other machinery of this type—is then lifted from the transfer car and deposited where required. Incidentally, this snatch block arrangement is also used for spotting freight cars or removing them from the warehouse doors.

As previously indicated, the derrick also loads out the equipment into highway trucks, which transport a large percentage of the shipments made from the plant.

The derrick moves hundreds of tons of heavy construction equipment monthly. The company's Vice President William R. Maddock pointed out that it is not only the most frequently used piece of material handling equipment but that the whole operation has been built around it. He added that the derrick has been in continuous use (with various types of motive power) for more than 24 consecutive years.

Derrick now deposits crated equipment on rollers spotted on the shop's grade-level dock.

In shop, this winch moves heavy equipment (using snatch block) to testing, repair stations.

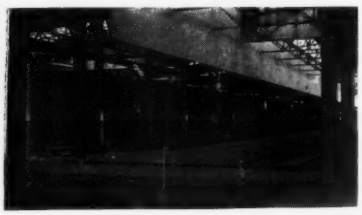


Cross-Over Bridges for Freight and Warehouses

THE MODERN freight house and warehouse use cross-over bridges to bridge the tracks serving the docks. Gone are the days when time was used to spot cars carefully so that doors of paralleling cars would be adjacent to each other. Efficiency demands heavy-duty movable cross-over bridges to handle the power operated lift trucks or tractors pulling long trains of trailers.

Many different types of cross-over bridges are designed to span one, two or even four tracks. All are so designed that they may be moved out of the way when not in use. Some of the most popular types are shown in this article.

Fig. 1 is an overhead type in lowered position—supported at the ends and



at the middle. This 10-ton capacity job spans two tracks and has a hoisting speed of eight ft. per minute. High and low limit switches are used, and a red light is displayed when the bridge is down—a green light when in raised position. In the latter position it usually is 22 ft. above rail level. The platform widths are made to suit particular requirements.

The ground-level type of cross-over bridge is shown in Figure 2. Like the

bridge just described, its screws are electrically operated and it comes in various lengths and widths, but is preferably designed to serve one or two tracks only. This type when raised is at dock surface level. Its surface has a pair of tracks that coincide with the approach service track rails when the bridge is in lowered position. It displays a green light when in lowered position—a red signal when raised.

For the smaller terminals, there is a hand-operated single traffic wheeled bridge that may be rolled under the dock when not in use. Fig. 3 shows a

view of one of these machines. It has side guards that may be raised when in service or lowered when not in use. It also has lever operated ramps at each end that may be raised to dock level when in use, or lowered when ready to be moved on its roller bearing wheels under the dock.

This bridge is shown in operative position—with side guards and ramps raised to dock level. After they are lowered this 10-ton capacity bridge may be rolled under the dock shown at the left.

Pinion and rack operated bridges are also available, as well as high speed overhead types serving as many as four tracks.

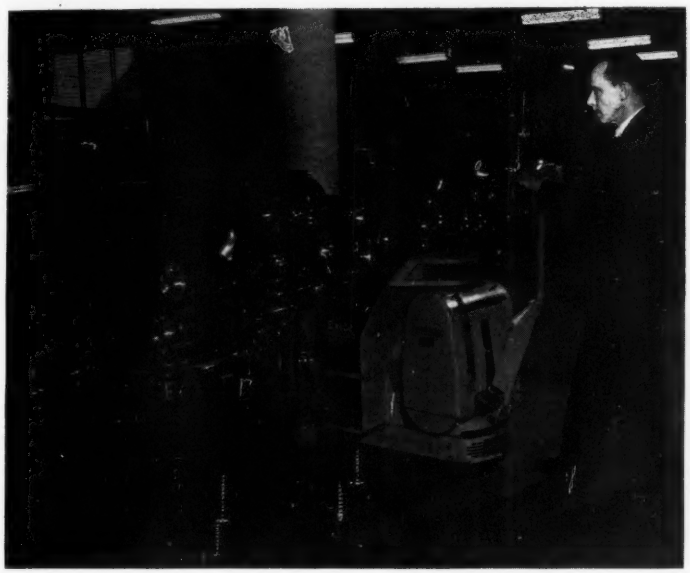
Data and photos, courtesy Whiting Corporation, Harvey, Illinois.

YOU MAY PARTICIPATE

$1,500 in awards are offered in the current FLOW Magazine contest for prize-winning papers on material handling cost reduction installations. Write for your contest entry blank to: Contest Editor, FLOW Magazine, 1240 Ontario Street, Cleveland, Ohio.

Tractor for Cadillacs

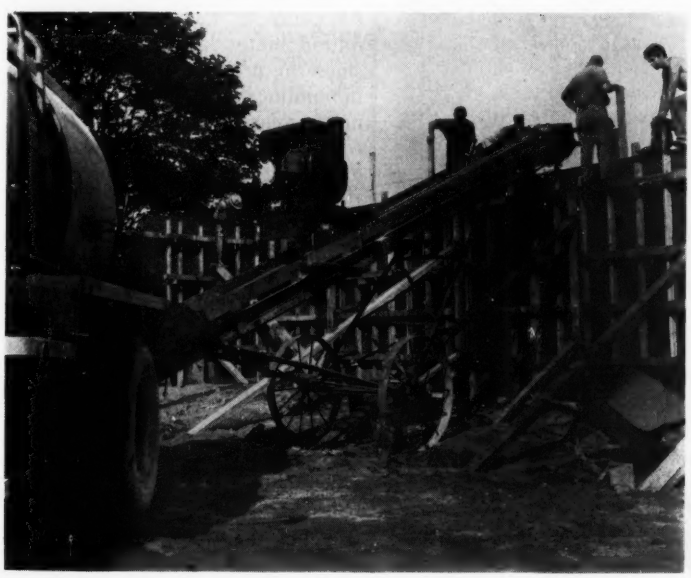
ADAPTING the principles of modern material handling to a new field, the New York branch of the Cadillac Motor Car Division of General Motors uses a motorized hand tractor to spot automobiles in its display



and storage rooms. This was formerly a heavy pushing job for several men. The tractor has a pushing and pulling capacity of 20,000 pounds, and one man now effortlessly moves the cars while a second man steers. The tractor's specially designed backplate pushes against the bumper, as shown. For pulling, the machine is equipped with a cable attachment which is fastened to the automobile's axle.—Courtesy, Automatic Transportation Co., Chicago.

Concrete Handling by Conveyor

HANDLING concrete from ready mix trucks to the point of placement is accomplished speedily (without intermediate handling) by a Pennsylvania contractor through the use of the portable trough conveyor shown here. The conveyor unit moves the concrete as fast as it can be handled by the men in the forms. Since this method eliminated the necessity for scaffolds and a hoist operator, the contractor is said to have reported exceptional savings by use of this method. The low feed end of the machine permits scraping material to the carrying belt instead of lifting it by shovel to a feed hopper.—Courtesy, A. B. Farquhar Co., Portable Machinery Div., York, Pa.



REVAMPING A WAREHOUSE . . .

(Continued from page 37)

canvas belt running beside their stations. The two separate belt lines forming this U (one for jobber and one for branch house shipments) discharge the full cases in two inclined belts that deliver to a nearby mezzanine section for top stitching, weighing and completion of clerical record detail. The lines on this elevated floor are gravity roller conveyors, and there are three of them. Besides the two for jobbers and branch houses, the third line is for shipments destined for our subsidiary. These latter cases travel from the south end of the plant via an overhead belt conveyor (see flow diagram) to this same central weighing and dispatching station.

The three lines of gravity roller conveyor converge on two 24-inch belt lines which move the cases via chutes to the first-floor shipping department. Here the containers land on one of two three-lane gravity roller conveyor tables. The cases are sorted according to destination and freight classification and placed on load carriers for movement to the truck dock about 50 feet to the north.

In a comprehensive project of this kind, it is understandably impossible to complete all planned details in a short span of time. One of these is the extension of the conveyor system directly from the sorting conveyors to the truck loading platform. The latter is to be enlarged considerably, and the extension of the conveyor lines is therefore dependent on this construction project. We hope to be able to carry it out in the near future.

Moving Stock to Bins

A final consideration concerns the stock replenishing procedure. The packaging of the items (for

stocking) is performed on the second floor in the extreme north end. From five conveyorized packaging lines the individual cartoned items flow via an overhead belt line (running north and south) to a central accumulating station indicated in the order selection area. (This is also the point of origin of shipments for our subsidiary.)

From the overhead belt line the individual packages are distributed to five packing stations arranged in parallel, and the items are shunted by deflector arms to each of the five operators. The merchandise is removed from the lines and placed into (a) either shipping containers or (b) stock trucks. Material for our subsidiary is packed in the containers which are shunted via gravity rollers to the powered over-head belt line, mentioned previously, that delivers to the mezzanine top stitching and weighing department. This accumulating station, as mentioned earlier, is circled by the overhead chain type conveyor supplying empty shipping containers.

The merchandise that goes to the stock shelves is placed in 30″ x 24″ x 36″ castered stock trucks, which are then wheeled to the numerous bin locations. An idea of the scope of this phase of the operation can be gained from the fact that there are approximately 7300 lineal feet of bins that average eight feet in height. Throughout, heavy-duty steel shelving is used which is vertically adjustable.

For every type of commodity, shelf space is set aside for overflow stock, which is later transferred as needed to the regular locations for selection purposes. In order to avoid the rehandling of many thousands of small cartons—first to the stock trucks, then from these to the overflow bins, and from here back to the trucks and finally to the regular bins—the operators at the accumulating area place all overflow items in 11″ x 13⅜″ x 14¾″ tote pans with open fronts. These tote pans hold many of the small cartoned items in one "unit", and when transfer is to be made the handling of many small individual cartoned items is avoided. It is just as easy for the operators at the accumulating station to place the material in the tote pans as in the stock trucks—and the saving in time and effort is considerable.

This, briefly, is how we at Thompson Products, Inc., move millions of pounds of commodities monthly (for several different types of shipments) through order selection, final packing and shipping. It seemed like a stupendous task, and its planning and engineering required many months, particularly since the present facility is located in buildings that have served a good many years. We realized, in this competitive period that has followed the era of the seller's market, that the tremendous project had to be carried out in the interest of maximum manpower utilization and low-cost handling. While some details and final improvements are still awaiting completion, we feel that the results have well repaid our efforts. The 50 per cent saving in manhours has meant the complete elimination of a second shift for order picking, final packing and shipping. These benefits will be felt throughout the years not only by ourselves but also by our thousands of customers.

COMPARE YOUR COSTS . . .
(Continued from page 23)

combination of these.

Column Two identifies the piece part number. Number Three gives the daily production in number of items. (The total yearly production could be entered alongside this column.) It is apparent that production figures are necessary in order to enable you to determine the actual number of pallets required. This would also provide a basis for arriving at the yearly cost comparison figure.

The data in Column Four (pieces per pallet) are determined on the basis of the following two factors: 1. The size and type of pallet adopted as standard. 2. The number of piece parts that can be placed on it, considering both product protection and maximum utilization of load capacity of carriers. "Number of pieces per pallet" requires a study of the blueprint of the items.

Note that in this particular case a 40″ x 48″ pallet was decided on. This size was found to be most adaptable for either rail or truck shipments. Another point must be borne in mind in this connection. It is usually desirable to standardize on as few pallets as possible. This is in the interest of economy as well as simplicity of operation. A large variety of load carriers soon becomes a burden, in terms of control, maintenance, cost and replacements.

Columns 5, 6, 7, and 8 show that this particular operation required four load carriers. The efficiency of the planning and engineering on this operation is indicated by the fact that these few carriers were actually adapted to several hundred different types of items. The quantity of each type of pallet used is indicated in columns six and seven.

Note that in Column Nine the pieces per pallet have been changed into weight figures. Column 10 gives the total yearly weight in tons. The reason is that most handling rate structures are based on weight and not on pieces. If you adopt such a cost comparison chart, it might be worth while to introduce here an additional column for the yearly container outlay.

Beginning with Column 11, all

costing is done on a comparative basis of the present vs. the proposed methods. When a column on total container requirements is added, this should preferably cover a year's needs. If the material was previously handled in bulk form, the "present" container cost will of course be zero since no containers were required.

Such materials, it may be found, can nevertheless be handled economically on pallets, though the latter may entail a sizable investment. The reason is of course that the subsequent handling economies in shipping, warehousing, and receiving not only offset the pallet cost but also leave a margin of savings. It can be seen from the figures that Item A represents such a case.

Column 11 gives the cost breakdown for each trip made by the containers. Column 12 is self-explanatory. It indicates the present and proposed labor cost in the shipping department. Note that the handling costs are totalled *per item* for purposes of convenient comparisons. The same type of comparison is worked out for warehousing and receiving in Columns 13 and 14. Column 15 is a recapitulation of 11, 12, 13 and 14, in which all "present" container and handling costs are totalled. The same is done for the "proposed" method in the second space in Column 15. Thus comparisons are easily made, and the total saving may be shown in a separate column (No. 16).

It may be well to restate the reason for the absence of a column showing depreciation of pallet handling equipment. As was previously explained, this company had pallet handling equipment in operation in other departments, and this was available for the present operation. Since this equipment had already paid for itself elsewhere, no depreciation was shown. Of course, if any handling equipment is purchased, then its cost must be amortized and a proportionate share charged against the job.

Item B differs from Item A in that it is an individual box handling job. While this operation is different from the bulk handling operation, the requirements for assembling the cost and production data are practically the same. In the previously suggested column "Yearly Outlay for Containers," the cost of the boxes would be shown alongside the cost of the pallets.

Item B also illustrates a substantial saving obtained by use of the load unit method of handling. While the total saving is smaller (because the volume was smaller), the ratio of the savings obtained is actually greater. Scores of items were involved in the original comprehensive study (from which these two examples are given), and in each case impressive savings were realized.

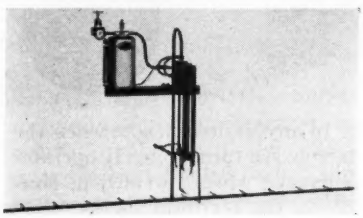
Once developed, the cost comparison is useful in a number of ways: 1. It definitely determines cost figures, which may be used as a basis for control or future refinements. 2. It gives management authentic records, on which the purchase of handling equipment can be predicated. 3. It helps clarify handling methods and needs before production is begun, thus aiding the flow of goods when they start coming off the line.

There is no substitute for knowing your handling costs!

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13.

CONVEYOR LUBRICATOR

NP95—The J. N. Fauver Company has recently installed a new type lubricating system for conveyors that have to operate through high temperatures. This unit was designed specifically for use on core-oven chains in a large automobile plant foundry. It operates 24 hours a day, in temperatures up to 550 degrees. The manufacturer's release states that the automatic lubricators have reduced horsepower needed to drive the conveyors and eliminated the necessity of an oiler on each shift.



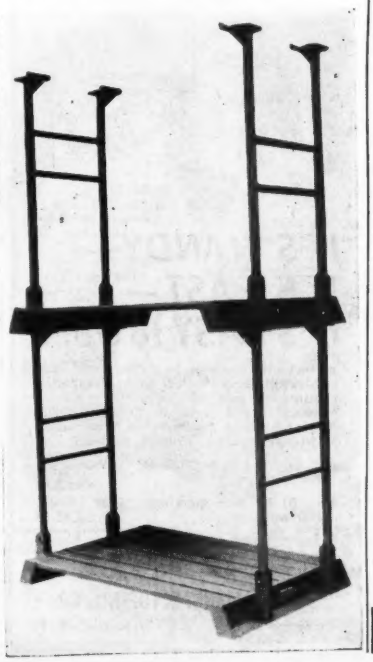
Each unit is mounted on top of the six-inch I-beam which carries the conveyor wheels, and automatically lubricates the wheel bearings from each side of the two wheels above each hanger. The unit also lubricates all link pins between hanger trolleys each trip.

SCOOP ACCESSORY

NP96—A "scoop" attachment for the Motowlift fork lift truck was recently announced by Service Caster and Truck Corp. The accessory is said to speed the handling of bulk materials, and may be attached to the fork carriage in five minutes. Capacity of the scoop is 10 to 17 cubic feet. It also features replaceable blades, all steel welded construction and an air cushion shock absorber to prevent slamming.

PALLET WITH SUPPORTS

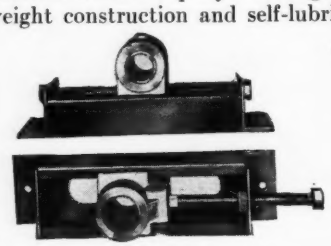
NP97—The Pallet Division of In-



dustrial Washing Machine Corp. has incorporated new features in the Multi-Stak pallet. Each pallet holds 4000 pounds of material, dead weight, and has four securely anchored post supports upon which succeeding pallets are piled and rigidly held in place, according to the release, while supports are quickly collapsible for compact storage in small space when not in use.

BELT CONVEYOR TAKE-UP

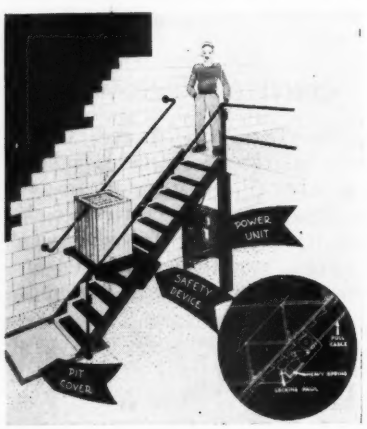
NP98—A take-up for belt conveyors introduced by the Patron Transmission Company is of light weight construction and self-lubri-



cating, according to a recent announcement. This unit, built with a pressed steel frame, has a corrosion-acid-resistant bearing housing fabricated from a heat treated aluminum alloy that is claimed to be unusual in strength qualities. Sizes range from 15/16 inch up to 1-5/16 inch in two types. Take-up travel is six inches.

STAIR LIFT

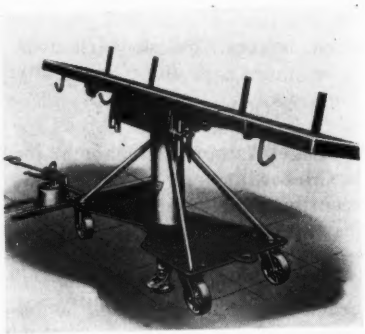
NP99—An elevator that operates over regular stairways is being produced by the Firestone Stairlift Company. The dimension of the elevator platform is 30 by 30. The platform recesses into the floor, ris-



ing to any desired height when the controls are turned on. It operates on flanged wheels, welded in position on the platform so that they fit on the 8-inch channels of the staircase. The unit can be obtained in any desired height depending on requirements. Manufacturer's release states the stair lift is designed for warehouses, industrial plants, hotels and other businesses.

TILT TOP TABLE

NP100—As an addition to its line of Strip and Sheet Feeding Tables, Lyon-Raymond Corp., offers a model with an adjustable tilting top for use with inclined presses as

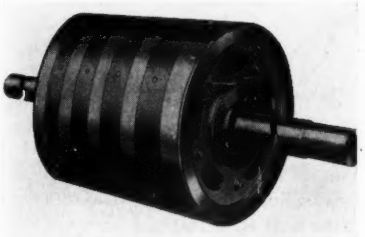


well as horizontal bed types. The model is available in 2000-pound capacity with table widths from 12

to 24 inches and lengths up to 96 inches, including the removable extensions. The top may be adjusted to a 30-degree tilt with several intermediate positions. When the correct angle of tilting is determined the table top is securely locked in position by removable pins, states the manufacturer.

MAGNETIC PULLEY

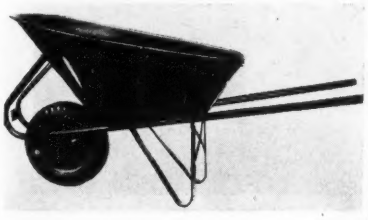
NP101—A magnetic pulley for removing ferrous metal particles and pieces from materials being conveyed is offered by the Homer Manufacturing Company, Inc.



Made of cast aluminum and steel, the units are available in standard diameters above 10 inches and in widths that are multiples of six inches. Ample ventilation dissipates any heat created by belt slippage or friction, the release states.

WHEELBARROW

NP102—A rubber-tired, heavy-duty wheelbarrow is being placed on the market by the Bordeau Engineering Company. Made of aluminum alloy, the unit is said to be light in weight, have a capacity of five cubic feet and width of 27½



inches. The equipment is available with standard or semi-pneumatic tires.

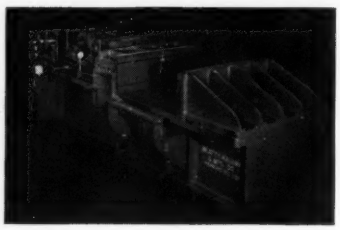
POWER HOIST

NP103—A power hoist for use in factories, warehouses, service stations, garages and construction work is now being made by the H. D. Campbell Company. Features of this unit, according to the release, are: eccentric drive for remote control, positive acting brake,

capacity of 1800 pounds, and lifting speeds up to 143 feet a minute.

HYDRAULIC BULLDOZER

NP104—For general application throughout the heavy metalworking industry this 400-ton Horizontal Hydraulic Bulldozer was designed by the Beatty Machine and Manufacturing Company. The ma-



chine features a high operating speed in relation to its heavy size. Specifications are as follows: maximum opening—60 inch; die space—24 inch; size of ram and resistance lug—20 by 60 inch. Speed is variable and controlled by the amount of movement of the hand lever or foot pedal, at operator's will.

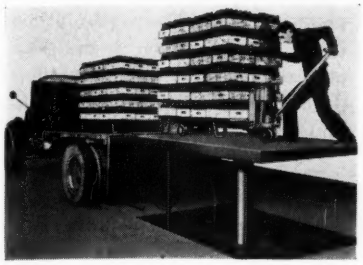
FIVE-TON DOLLIES

NP105—Safe and fast moving of freight, dies, machinery and other material is claimed for the new five-ton Skid-Rol Dollies manufactured by the Techtmann Industries. The units come with an adjustable extension bar and are obtainable in pairs, or singly, with or without cleats, and have a capacity of five tons per pair. Size of each dolly is 15¼" x 6⅛" x 4" high with 3⅝" diameter solid steel rollers. Minimum span of a pair of dollies with the extension bar is 36" overall—maximum 56"; thus, these units have a 20-inch telescopic expansion. All bearing surfaces are hardened and the structural steel frame is arc-welded, according to the release.

PLATFORM LIFT

NP106—Designed for lifting, loading and materials handling operations, this hydraulic powered platform lift is offered by the Globe Hoist Company. The manufacturer states that this unit can be used for either inside or outside work. When used as a loading dock for trucks, trailers or freight cars, this device raises loads up to 5,000 pounds and to a maximum height of 54 inches. When used inside, this equipment is

adapted to machine feeding operations or to eliminate differences in



the same floor level. Control is by a hand operated lever.

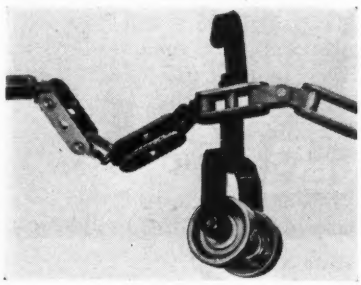
STEEL PALLET

NP107—A new steel pallet that permits the forks of lift trucks to be slipped between the top and bottom sections from eight different di-

rections is being marketed by the Monroe Auto Equipment Company. Known as the eight-way pallet, it can be lifted from four sides as well as four corners. The pallet is designed for all types of load handling operations, in factories, warehouses and on docks. The units are available in six sizes and hold up to 20,000 pounds of boxed or bagged materials.

MULTI-PLANE CHAIN

NP108—Developed and produced by the Leeds Electric and Mfg. Co., the Multi-Plane Chain is said to



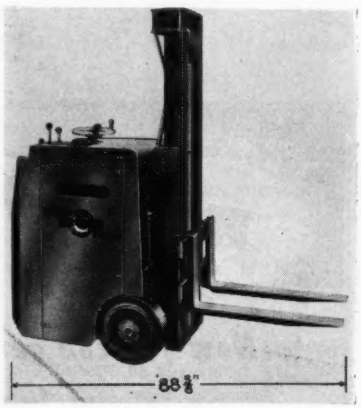
bend as much as 45 degrees to the reverse of the field of travel. Designed for use on overhead conveyors, infra-red systems, greasing operations and oven work where greased chains are not practical, it has been found adaptable where small radius curves are desirable and sharp bends on various planes follow each other.

The chain consists of two milled pieces rounded at the outer ends and cut for male and female connections in the middle with a steel pin. The outer ends are drilled for

fastening together with a stamped steel flat link on each side. These flat links have a hole punched in the center for connection of trolleys, pusher-bars, hooks, or other special equipment.

FORK-LIFT TRUCK

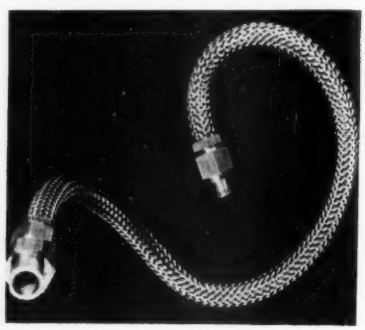
NP109—Designed for warehouses and plants with narrow aisle space,



this fork-lift truck is being made by the Crescent Truck Company. The manufacturer states that this unit is designed to stack 42" x 32" pallet loads at a right angle in an eight-foot aisle. Capacity is 2,000 pounds with 36" length of load; 1,750 pounds with 42" length of load. Other features given in the release are: all controls hand operated; hydraulic lift; simplified inspection and maintenance.

FLEXIBLE METAL HOSE

NP110—Seamless, flexible metal hose made of a special bronze alloy



is offered by the Brockway Company, according to the release. The flexing quality of the hose is dependent upon characteristics built into the product, such as form,

depth and frequency of corrugations, and material. For safety and to prevent elongation of the material, the hose is encased in a high-tensile Bronze Wire Braid. The fittings are short and permit the use of more hose length, thus providing maximum maneuverability, the company states.

Motorized Slewing Boom

SHOWN is a new interchangeable motorized slewing boom attachment for Automatic fork trucks, just announced by Automatic Transportation Company, Chicago. The unit was introduced at the Railway Supply Manufacturers' convention June 23 in Atlantic City. The boom is manually adjustable in outreach from 54¼

inches to 108¼ inches; it is vertically adjustable from horizontal to an upward angle of 30 degrees; and it swings horizontally 60 degrees to either side of center. Mounted on a standard 6000-pound capacity Automatic fork truck chassis, as shown, the boom will handle 1100-pound loads at the maximum outreach and 1820 pounds when in closed position. Maximum height of the hook is 18 feet 5 inches. Quickly detachable, the boom may be replaced by standard forks, gooseneck crane, motorized fork carriage, ram or any other similar attachments for standard or specialized handling operations.

YOU MAY PARTICIPATE

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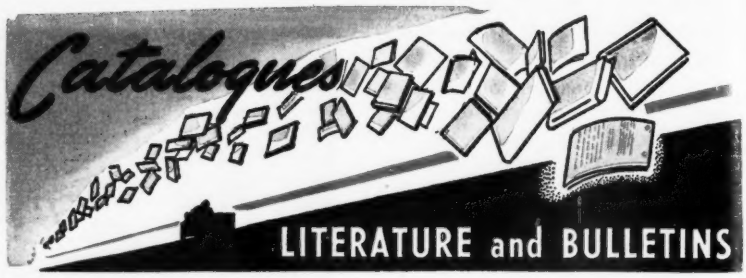

The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

352—Industrial Tractors . . . A file folder by W. F. Hebard & Co. containing many illustrations of industrial tractors at work. Use of tractors in rail yards, bus garages, airline repair hangars, freight depots and street maintenance are amply illustrated.

353—Air Hoist . . . Three models of hoists with capacity ratings from 300 to 1000 pounds are described in a brochure issued by the Keller Tool Company. These models feature: lightweight construction (total weight 30 pounds); variable speeds controlled by the operator; hook-to-hook dimension of 12½"; wall clearance, 5"; overall length, 14½". Users listed in the folder for this equipment are: foundries, machine shops, press rooms, textile mills, railroad shops and industrial plants.

354—Wheels . . . All sizes of wheels for in-plant material handling equipment are illustrated in a bulletin released by the Champion Iron Works, Inc. The wheels are said to have sealed ball bearings, puncture proof demountable tires, and heavy stamped discs.

355—Plant Maintenance . . . An information packet consisting of three folders and a maintenance check chart has just been published by United Laboratories, Inc. The booklets cover the following subjects: (1) Plastic Rock flooring for loading docks, warehouses, and plants; (2) Caulking com-

OPPORTUNITIES

Men wanted *Jobs wanted* *Lines available*

Rates: for "Positions Wanted" $3.50 minimum, limit 25 words. For all other classifications $3.50 minimum for 25 words, each additional word 10c; boldface type or all capitals, $6.00 minimum for 25 words, each additional word 15c; limit 50 words. Box addresses count as five words. All insertions are payable in advance.

REPRESENTATIVES WANTED

Agencies for sale of nationally distributed line of portable wheel and roller conveyor, wanted in Boston, Pittsburgh, Indianapolis, Memphis and Denver. Write advising lines already handled. Box 7147, FLOW.

AGENTS WANTED FOR STAIR-LIFT

Replaces existing stairway. Conveys materials on lower landing which rides on channel sides to next floor. Equipped with highest quality rollers. Complete safety devices-foolproof. Numerous installations. All users enthusiastic. Selling price under $1000. Write for full information and our profitable sales proposition.

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Gasoline Fork Truck Manufacturer interested in dealers in several eastern cities. Only well established industrial suppliers or materials handling equipment distributors will be considered. Write, giving full particulars in Box 8247, FLOW.

Export Sales

Export Department of New York firm specializing in sale of Materials Handling Equipment wants additional lines. Will act as Export Department for manufacturers. Box 8347, Flow.

WANTED—LINES

Industrial Engineering Co., located in northern Indiana, interested in handling material handling equipment and other commodities of similar nature. Box 8147, FLOW.

Sales Organization composed of graduate engineers will intelligently and aggressively represent you in Louisiana and Mississippi. Address Alpha Engineering Company, P. O. Box 475, Baton Rouge, Louisiana.

FOR SALE

3 Baker low lift electric platform trucks
2 Elwell-Parker low lift electric platform trucks
1 Clarkat tow-tractor, gasoline
3 Portable electric elevators
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pound for sealing out cold air, dirt, drafts and moisture; (3) General information covering types of products manufactured and application to industrial maintenance needs. The chart shows the many check points that require maintenance in plants and gives the product or process used. Helpful data on floors of all types, roofs, insulation, waterproofing and resurfacing are also given.

356—Steel Strapping . . . A 32-page booklet, "Savings in Shipping", has been released by the Strapping Division of the Acme Steel Company. This booklet presents comprehensive studies on packing costs and shipping of plywood, yarns, books, food, motors, furniture, farm equipment, bottled goods and a host of other items. Strapping accessories such as stretchers, sealers, coil holders, shears and barbed box straps are covered on the last 10 pages.

357—Infra-Red Ovens . . . Use of infra-red ovens coordinated with conveyorized production methods is discussed in a 12-page folder by Jensen Specialties, Inc. The publication illustrates operations in a stove plant, tool manufacturer, trailer producer and a manufacturer of children's tricycles. These ovens are said to be doubly enclosed, thus retaining all the heat generated.

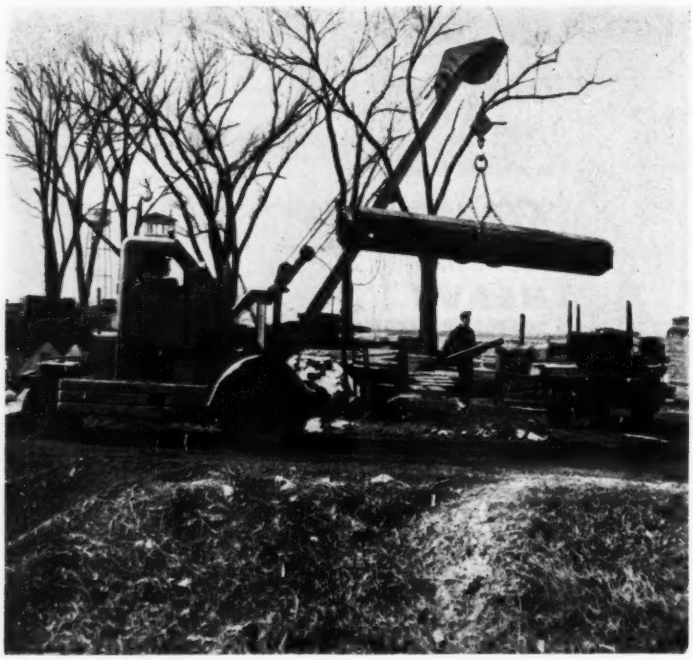
358—Chain Drives . . . Its 3/16" Pitch Silent Chain is the subject of a new 16-page illustrated book released by Link-Belt Company. Listed among its many applications are aircraft mechanisms, blowers, bread slicers, button machines, cameras, cigar making machines, conveyors, doughnut machines, ice cream freezers, meters, oil burners, portable planers and sanders, motion picture machines, timing devices, typewriters and phone generating sets. A variety of drive arrangements is shown on page nine with numerous actual installations, including one drive using duplex 3/16" pitch silent chain winding around 14 cut-tooth wheels. Side flange, middle guide and duplex types of chain are shown. The book also contains dimensions of sprocket wheels, horsepower ratings, and other data.

359—Portable Bridge Ramp . . . A new folder describing the "One Man Bridge Ramp" has been published by the Elizabeth Iron Works. An accompanying survey and specification sheet helps select the correct size and type of ramp to fill most requirements. The folder states that this ramp has a 15,000-pound capacity and can be placed and secured by one person in less than five minutes. It may be transported to location between platform and freight car or between two freight cars on the forks of any standard fork lift truck.

360—Crates and Boxes . . . A colorful, easy-to-read booklet published by the General Box Company describes the assembly and use of widebound crates and cleated corrugated boxes in safe shipping practices. Illustrations keyed to text show a sequence of packaging procedures for tools, foundry products and radios. Considerable information is included on inner packing, supports and the blocking of products for safe handling and shipping. One page of the booklet is devoted to a discussion of the use of pallets, skids and lift boxes for general industry.

UNPAVED YARD OPERATIONS

HANDLING of 16-foot lengths of structural steel in the unpaved storage yard of the International Harvester Company, East Moline Works,



has been simplified by use of a mobile crane. This 10,000-pound capacity, pneumatic-tired crane is used to unload gondola cars, stack material in storage and load trailers for delivery to receiving platform. Cab enclosure and lights permit all weather and 'round-the-clock operation. The trailers are pulled by crawler-type industrial tractors.—Courtesy, International Harvester Co., East Moline Works.

CRANE HANDLING . . .

(Continued from page 26)

until the truck has been raised to the proper height for feeding the strip into the press.

The flow of the blanks (and the scrap) from the presses is also frequently observed in detail. As the strip of steel is blanked through the die, the blanks drop through the bolster plate and onto a cleated conveyor belt (see photo), which discharges the material into a castered box truck. The trimmings, which are cut off back of the blanking guide, are discharged into a scrap cart (which is later emptied into a square bucket spotted in one of several pits).

Scrap Handling System

While much thought was given to eliminating extra handling of the sheared stock, scrap handling was likewise made the subject of a separate project. Specially designed buckets for crane handling are a feature of this operation. After considerable experimentation, a large steel bucket, five feet square and four feet deep, was developed. We now have 36 of these containers in use. They are of reinforced welded construction. The sides are made of ¼″ steel reinforced with angle iron on the corners and 3″ channels on top. Two trunnions, one on each side, are located below the center; the center of gravity is also lowered by adding extra weight to the bottom of the container, which is made of ⅜″ steel. The off-center position of the trunnions (in a vertical direction) and the extra weight at the bottom cause the bucket to turn right side up when empty and suspended from the crane hook.

The grab hooks engage the trunnions, and the lock bolt on the grab engages with two lugs (on one side of the bucket, at the top). The lock bolt on the grab is cam-operated and locked in position when the grab is located for lifting the bucket.

While the low center of gravity causes the empty bucket to turn right side up, the full bucket is top-heavy, causing it to dump automatically when the locking device is released. It is the lock bolt, of course, which keeps the bucket upright while being lifted either for

temporary storage or for discharging into gondola cars or into the highway trucks.

Following are the details of the scrap handling procedure. The loaded scrap carts (25" wide, 46" long, 17" high) are wheeled from the presses to one of four scrap pits (a fifth serves for sweepings) which are sunk in convenient locations in the crane bay. Each pit accommodates two of the large-capacity buckets. When full, the containers are lifted out by the crane and stored temporarily along the north wall on a strip that is bordered by the spur track on the other side. As previously indicated, when a car is being loaded, the lock bolt is tripped and the bucket then dumps automatically due to the top-heavy condition. (The trunnions are located near the bottom at one-third the bucket height.) These buckets, incidentally, weigh about 1,800 pounds each and have been in continuous use for about two years without the necessity of any repairs. Each unit will hold between 8,000 and 10,000 pounds of scrap metal. Due to the large capacity of the containers, a gondola car is loaded in a relatively short time. In fact, this method had saved, on an average, 32 manhours per car over the previous wheelbarrow method in the loading operation.

Thus, we have managed to locate as many activities as possible for handling by crane. It handles all raw material in receiving and storage. It feeds the sheet steel to the shear, supplying production. It serves for scrap storage, double-decking the buckets and thus conserving floor area (as in the case of raw material storage). And, finally, the crane also loads the scrap into outbound gondolas and highway trucks. Another of its functions, not previously mentioned, but nonetheless important, is the transporting of incoming machinery and parts, which may arrive either by rail or highway carrier.

The crane-handled buckets, it will be noted, have made possible an economical and efficient scrap disposal system. Sorting is reduced to a simple function because different buckets are designated for certain kinds of scrap. At the same time good housekeeping and plant safety are promoted.

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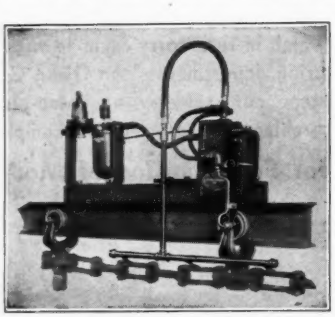

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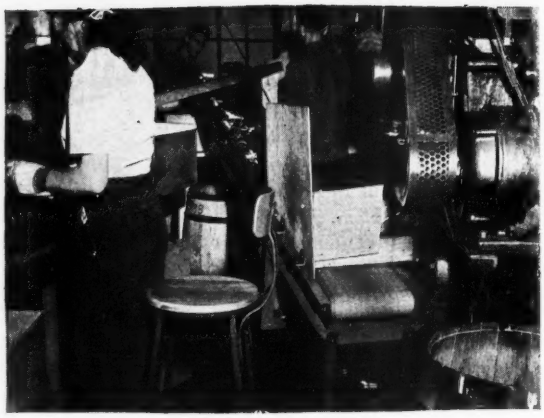

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ON THE PALLET . . .

(Continued from page 38)

meeting the needs of that area. (6) Compare the value of the territory surrounding a center with that of the center itself as a source of shopping line purchases.

DRAKE, Startzman, Sheahan, Barclay, Inc., Distribution and Materials Handling Consultants, New York City, announce the opening of an office at 5816 Wilshire Boulevard, Los Angeles, California. The office will have a staff of resident engineers and will be under the direction of Neil Drake.

COMPLETION of a new plant at Pittsfield, Mass., for the manufacture of magnesium oxide by General Electric's Chemical Department, was announced by John L. McMurphy, manager of the Compound Division. The new plant, which comprises about 10,000 square feet, will double General Electric's capacity to produce magnesium oxide. The product is used principally in industrial heating equipment as an insulator between central heating wires and metal sheaths. A highly refractory material, it can withstand temperatures as high as 5000° F. The new plant is equipped to purify, densify and grind crude magnesium oxide.

Have you sent for your entry blank in the current FLOW cost reduction contest? You may share in the $1,500 award money offered for prize-winning papers on projects that reduced material handling costs.

SCRAP METAL HANDLING . . .

(Continued from page 44)

method was not only space-consuming but also involved considerable travel for the fork truck.

A representative of Behr's surveyed the operation in relation to the new dump-type containers that were now available. It was suggested that the customer use a swiveling attachment or an automatic dumping tray on the fork truck for dumping the scrap directly into the buckets. The method was adopted, with these results. The large trays in circulation were reduced by 66 per cent, which eliminated the use of valuable productive areas for scrap storage purposes. And, because the buckets could be spotted adjacent to the operation, truck travel was reduced from a maximum of 500 feet to 70 feet.

PROGRESS A MATTER OF VIGILANCE

JOSEPH BEHR & SONS, INC., is now in the midst of planning a conveyorized system for its rag sorting operation. While this phase is still largely in the blueprint stage, its chief features are known well enough to be indicated here in outline.

In the past, rags from trucks and cars were unloaded by hand labor, and the loaded rag crates were sent to the third floor. It was then necessary for a number of women to sort this material into many classifications. Each sorter was required to know approximately 25 to 35 different grades.

Under the new system, however, cars or trucks will be unloaded by means of a conveyor system. The rags will be conveyed to a sorting conveyor belt on the upper floors where they will be sorted quickly. By means of chutes, the material will be dropped into hoppers and from there directly to the balers. Under the new system, the women sorting the rags will only be required to know three to five different grades of rags as compared with 25 or 35.

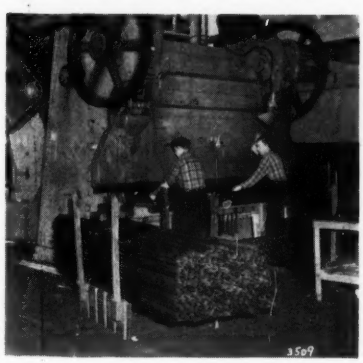
Another interesting sidelight of the operation is the company's continuous educational program to keep employes informed of the

labor-aiding, safety-making equipment provided. Each employe using the mechanized equipment is thoroughly grounded in its use when he starts working with it.

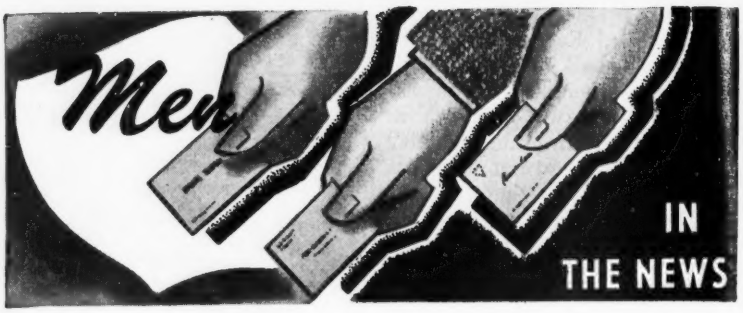
It is apparent from the foregoing that in a scrap metal and rag operation, as in any other industry, the right handling tool for each job is a matter of unceasing vigilance and study—and the key to a profitable operation. The same cranes, for example, operating with inadequate below-the-hook devices would be cut down considerably on their productivity. The loading of battery lead and aluminum turnings by use of the chute is another case in point. The progressive improvements in handling barrels of brass turnings, paper by the crate instead of by the bundle, stampings in large-capacity buckets instead of by the shovelful, as well as the plans for the mechanized rag sorting operation, all are clear-cut examples of the progressive trend to low-cost handling by use of the right tool. The plant that is satisfied to go along with the methods of another year or another decade is simply paying part of its profits for unnecessary time, space and effort.

TIERABLE STEEL SKIDS

REMOVABLE steel stakes are in use by the E. F. Hauserman Company, Cleveland, in connection with standard steel skids. The stakes permit tiering of skid loads of structural steel members held in intermediate storage in



the press department. The 3" channel iron stakes are supported by 6"-long pockets welded to the sides of the skids. The 37"-long units are fitted with steel brackets at the top into which the steel skids are lowered for tiering. Development of these stacking skids in conjunction with high lift platform truck enables Hauserman to double storage facilities in limited floor areas.



FRANK YOUNG has been named Ohio district manager for The Hertner Electric Company, with headquarters in Cleveland. Young is a graduate electrical engineer with many years' experience in selling industrial electrical equipment. During the war he served as lieutenant in the navy, and since leaving the service he has spent several months in the Hertner home office.

ALICE HONORE DREW, advertising manager of TelAutograph Corporation, has been retained as advertising consultant for Holtzer - Cabot Division, it was announced by Walter F. Vieh, president of First Industrial Corporation, Boston, the parent company. The company operates the specialized electrical motor manufacturing division, Holtzer-Cabot. Miss Drew will continue at TelAutograph where her work has gained national recognition through many advertising awards.

J. A. BALDINGER has been named assistant to the general manager, Elmer F. Twyman, at Automatic Transportation Company, manufacturers of electric industrial trucks. Baldinger's promotion comes after nearly two years as assistant sales manager of Automatic's truck division. A lieutenant in the navy, Baldinger had extensive experience in material handling and allied fields. During the war he served in the U. S. Navy Bureau of Ordnance, directing design, procurement and distribution of ordnance handling equipment

A. J. DARLSON is in charge of the newly opened Atlanta subdistrict office of the Edison Storage Battery Division of Thomas A. Edison, Inc., according to an announcement by J. A. Mustard, Jr., district manager. The office was established to provide improved service to users of industrial storage batteries in Florida, Georgia, and North and South Carolina.

NEW officers and directors of the Material Handling Association of Southern California for 1947-48 are: front row, left to right, Stanley E. Morris, Stanley E. Morris Company, Vice President; Glenn A. Harshbarger, Frank E. Witte Company, President; and J. E. Badgley, Western Industry, Secretary-Treasurer. Second row: Milt Canfield, Jr., M. E. Canfield Company, Director; and T. A. Fitch, Irving G. King & Company, Director.

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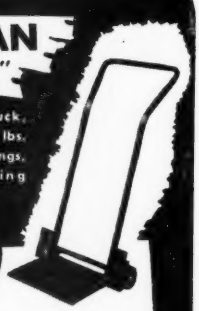

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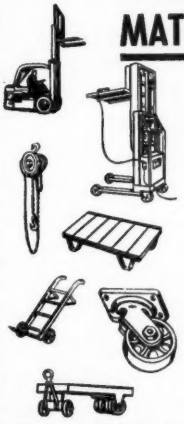

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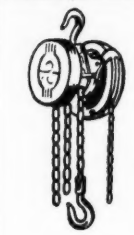
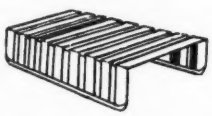


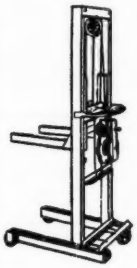




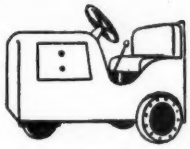

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TRANSPORTER:
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Specialized Intra-Plant Materials Handling Engineers Who Offer:

- The Experience to Guide.
- The Ability to Serve.

THROUGH THESE DEPENDABLE FACILITIES

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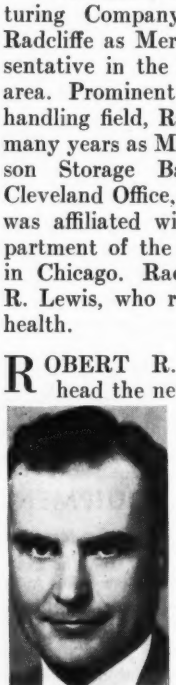
GEORGE P. TORRENCE has been named president of the Link-Belt Co., Chicago, Ill., succeeding William C. Carter, retired. Torrence joined the firm in 1911 as a draftsman. Since, he has served as manager and later president of the Indianapolis operations. In 1936 he accepted the general managership of the Rayon Machinery Corp., where he left in 1944 to become president of the Cleveland Pneumatic Tool Co. Returning to Link-Belt in 1946 he was made executive vice-president.

MORRIS M. STERN, general manager Mid-West Terminal Warehouse Co., Kansas City, Mo., has been elected general chairman of the Missouri Warehousemen's Association, Inc., for 1946-47. Claude Roberts, Leritz Storage & Moving Co., Kansas City, was elected secretary-treasurer. New heads of the Merchandise and Household Divisions, respectively, are C. C. Daniel, Jr., president, Central Storage Co., Kansas City, and J. E. Stelmach, general manager, Aalco Moving & Storage Co., St. Louis. Election was held at recent 23rd annual convention of the association in Columbia, Mo.

L. J. KLINE, Executive Vice President, Mercury Manufacturing Company, named A. E. Radcliffe as Mercury Sales Representative in the Cleveland-Buffalo area. Prominent in the material handling field, Radcliffe served for many years as Manager of the Edison Storage Battery Company, Cleveland Office, and prior to that was affiliated with the Sales Department of the Edison Company in Chicago. Radcliffe replaced J. R. Lewis, who resigned due to ill health.

ROBERT R. KOVACH will head the new Chicago district offices of the Electric Products Company. He will be responsible for handling all sales and service negotiations in this area. He joined the Electric Products Company in July, 1946, after six years of sales and engineering experience as well as a year of management consulting.



ROBERT C. BRADY has joined the Ingersoll Steel Division, Borg-Warner Corporation as Material Handling Engineer. Brady was formerly with the Helene Curtis Industries and his experience covers material handling in a variety of industries. He was a speaker at the 1946 National Material Handling Exposition.

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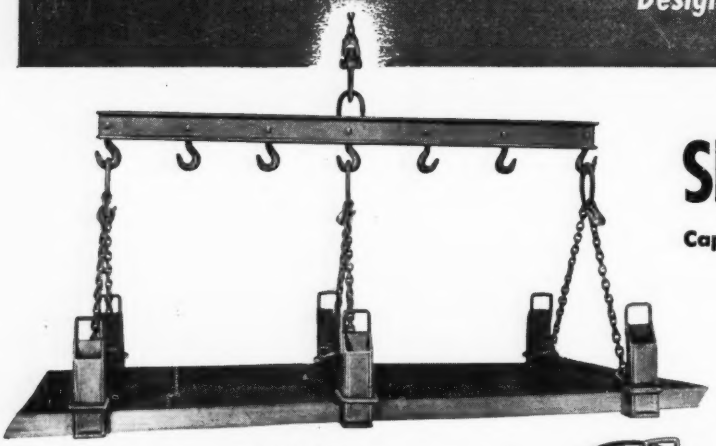
Designed to do Specific Jobs Better



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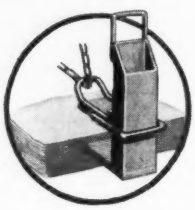
Capacity 1, 2 and 3 tons (1 ton per sling)

Adaptable to any size lift of sheets within 0" to 9" in thickness, 18" to 48" in width, any length. For short bundles use one grab without beam, for average bundle use two grabs—for long, flexible bundles use three grabs. As illustrated, handles three tons. Holds without slippage, distortion or damage to stock. Adjustable for low head room. Supporting beam 6 feet long—carefully engineered and heavily constructed for extra safety and service.

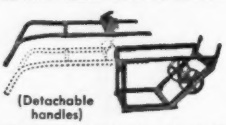
NS-364 $150.00 complete
Weight 190 lbs.



We Design and Build all types of pick-up, loading, moving, shipping, dumping and storage materials handling equipment.

NS-506DH
(Detachable handles)
$44.50

Combination
Truck and Drain Rack



(Detachable handles)

Automatically loads barrels up to 1,000 lbs. with ease. Heavy all welded angle iron frame, tubular handles, free rolling wheels. Detachable handles for storage.

Trunnion Box Truck

Speeds handling. Of heavy bar stock, well reinforced, tubular handles, welded construction. Two 10" roller bearing metal wheels.

B-268 **$37.50**

B-290 T Box **$13.85**

12 gauge steel plate square trunnion box—18" x 18" x 24". (Minimum lots of 10.) Wt. 80 lbs.

Industrial Dust Pan
S-703
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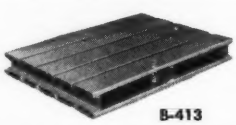
Sturdy, light to handle. Basket 16 gauge sheet steel 18" x 18" x 18"—frame all welded construction—8" rubber, ball bearing wheels. Wt. 45 lbs.—capacity 1 bushel.



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Double Face All Metal Pallet

Built for extra heavy duty—two way—for power fork truck only. Special rolled steel, corrugated. (Other sizes, types to order.)

Two Wheel Hand Truck

With safety knuckle guards—straight back for handling boxes, crates, bags, etc. Heavy 7" nose plate. Reinforced welded angle iron frame.

B-439ML $19.50
20" wide, 48" high, metal wheels

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18" wide, 42" high, metal wheels

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B-439RS $20.00
18" wide, 42" high, rubber tired wheels

B-205
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Handles barrels, drums, kegs—anything with a lip. Half ton capacity. Heavy welded chain and forged grab hooks. Wt. 8½ lbs.

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J-632
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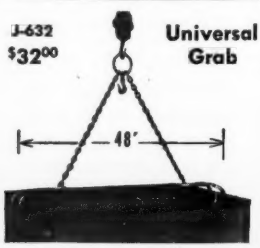
Universal Grab



Hook type, picks up heavy boxes, crates, bales, from 16" to 48" across. Heavy forged steel hooks with adjustable spread. Capacity 2,000 lbs.

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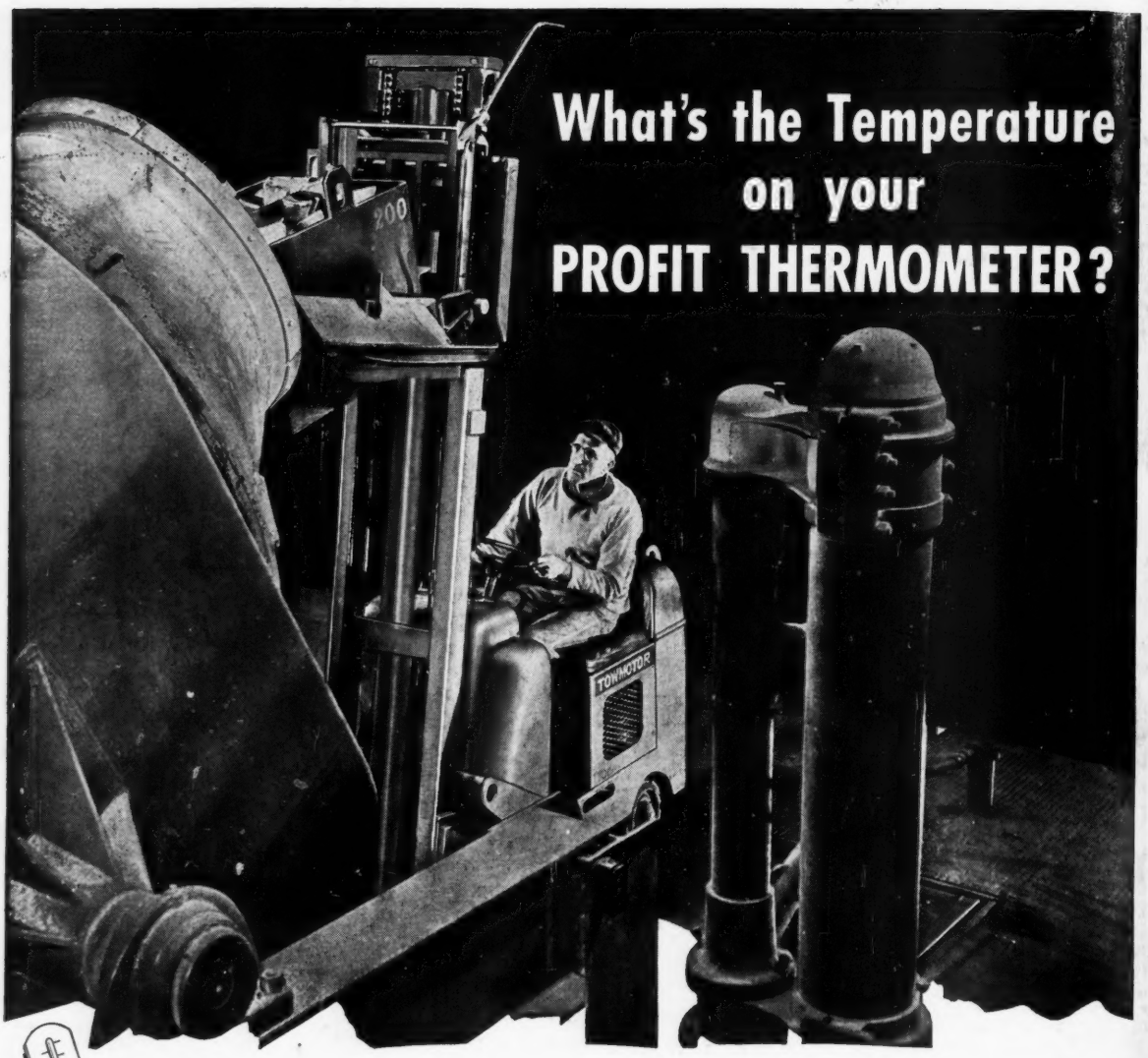

If your profits are hovering near the zero mark, put the heat on handling. Inefficient handling will freeze up the flow of materials through production, reducing productive output. Towmotor Fork Lift Trucks and Accessories will thaw out production bottlenecks, keep materials flowing in a steady, controlled stream that keeps men and machines producing at capacity. If you're looking for "warm weather" readings on your profit thermometer, send for a Pocket Catalog. Towmotor Corporation, Division 8, 1226 East 152nd Street, Cleveland 10, Ohio.

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